The Travel Script:

Exploring the Construction and Engagement of a Mental Structure as the Link between the Influence of Situational and Social - Psychological Factors in Commuting Decisions along a Life Course

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Submitted for the degree of Doctor of Philosophy

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November 2016

Abstract

To realise a resource efficient urban transport system, both hard and soft, or voluntary behaviour change policy measures, have to be implemented. Understanding the interplay of different factors surrounding the travel decision making process is necessary to support this policy approach. This qualitative research explored the travel script as the mental link between situational and social - psychological factors in individuals' travel decisions. Using in-depth interviews, the commuting histories of 82 commuters in Edinburgh, Scotland were collected and analysed. Factors that enabled or constrained the preferred commute mode were identified as the building blocks or knowledgeability of a travel script. Key events along a life course were identified as the situations that bound these constraints and enablers, making them more or less salient influencers of the travel decision at different points in the life course.

By considering the sequence of key events related to the household, employment or residential biographies, and those related to mode changes, the study explored when the knowledgeability of the life course may lead to a turning point in the commuting biography of individuals. The study also considered how individuals judge the amount of mental effort to be expended to engage a travel script at the turning point; and later in bringing about the sustained engagement of the travel script. Individuals were noted as belonging within the identity group either geared at economising mental effort or digging deeper to "an extra little thing in the system" to engage the preferred travel script. Furthermore, in the engagement of a travel script, social - psychological attributes underlying the commute goals and the desired state of self - identity seem to be evaluated in such a way as to be in line with these identity groups. The research findings emphasise the reflexive interdependence of situational and social - psychological factors in bringing about a turning point and sustaining the travel script engaged afterwards.

The treatment of the construction and engagement of the travel script along individual's life courses in this study provides an original contribution to travel behaviour literature: firstly in its use of concepts from Structuration theory, which no other travel behaviour study has used; secondly, in its addition of knowledge to the mobility biography, travel habits and travel identities literature. The research also provides further evidence to researchers on the need for extensive public transport and active travel infrastructure; and the need for a patient and concerted effort towards a culture change away from car dependence in commuting.

Dedication

"What return can I make to Yahweh for his generosity to me?

I shall take up the cup of salvation and call on the name of Yahweh."

Ps 116:12-13

Acknowledgements

I would like to thank Professor Angela Hull and Dr. Peter Matthews who supervised the first half of my PhD studies. Their guidance and encouragement gave me the firm foundation I needed to proceed when they had to leave. I am grateful to the supervisors on to whom the supervision baton was passed - Dr. Guy Walker and Dr. Caroline Brown - who guided me through data analysis and writing up. I especially thank Caroline for her kindness when I was at the lowest point of my studies.

I am grateful to Heriot-Watt University for the fees waiver that enabled me to pursue this PhD; to The Reid Trust for the additional funding that bought me the time I needed to carry out and transcribe interviews without falling behind schedule; to Transition Heriot-Watt for allowing me to search for respondents through their travel survey; and to the postgraduate research administration staff for their help in following up the approvals I needed to attend the conferences I did. I am very thankful for all the people at the Heriot-Watt University campus and Research Park who responded to my e-mail, more so those who took time to be interviewed.

I am grateful to my friends: my colleagues in the PhD office for sharing the journey; my friends at CathSoc who used their words to speak life; the Augustinian friars at St. Josephs for ministering to us; and the people whose simple acts or words of kindness were a source of extraordinary encouragement - Tillie, Alistair and Fiona at the chaplaincy, Stephen and Betty, Mr and Mrs Azanu and family, Elena, Caroline A. Ocheng, Gorreth Naruyange, to mention a few.

Most of all, I thank mama, papa and all my siblings for their constant support, but most especially for their selfless love and prayers.

ACADEMIC REGISTRY
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Chapter 1: Introduction

1.1 Background

The overarching purpose of this research was to assess how individuals make their travel decisions; what factors come into play to assist or influence the making of these decisions; and how these factors contribute to the process of travel behaviour change. In particular, the research set out to investigate the link between situational factors and social - psychological factors in travel decisions throughout an individual's life course. These issues are significant in light of the general pro - environmental behaviour debate surrounding current sustainability research. Between 1990 and 2008, while emissions from other sectors were decreasing, those from transport continued to increase (European Environment Agency, 2011). Road transport contributes about one fifth of the European Union's total carbon dioxide emissions (European Commission, 2013). Researchers such as Kohler (2005) propose that emissions from transport may be reduced by improvements in the environmental performance of transport systems technologies or by changes in transport behaviour. Improvements in transport systems technologies or infrastructure are generally more cost intensive compared to soft interventions such as encouraging behavioural changes. Current environmental policy in the UK, therefore, pays particular attention to developing frameworks that support behaviour change. Understanding the interplay of different factors surrounding the travel decision making process is necessary to support this policy approach. This research will contribute to the body of knowledge surrounding how individuals, in making decisions related to commuting, act within the social structures they inhabit to produce their desired outcome.

1.2 Research Gap

Policy makers and researchers in transport and travel behaviour are currently pushing for more sustainable travel (walking, cycling, use of public transport) using both soft and hard interventions. In Scotland, hard measures in the form of investment in public transport are being implemented, for example: the Edinburgh - Glasgow rail improvements; and the Scottish green bus fund aimed at making bus service greener, more efficient and easier to use. Soft measures, also known as voluntary behaviour change programs, are aimed at changing attitudes and subsequently behaviour. In the UK, soft measures in the form of TravelWise campaigns started in 1993 and emphasised

advertising, awareness raising and education about the use of public transport and active modes. The campaigns proposed measures such as, personalised travel planning, school and work travel plans, as complementary to the hard measures. Detailed analysis of the experience of voluntary behaviour change programs of several countries demonstrated a reduction in car use in the order of 10% (Goodwin, 2008). Cairns et al. (2004) note that soft policy measures offer good value for money and can be effective in facilitating choice to reduce car use if implemented within a supportive policy context. With these soft interventions, there is recognition that the individual has to act within the social and material structures they inhabit; that in negotiating the social world, the individual finds ways around perceived obstacles using the means they have at hand. Research is in agreement that social - psychological factors such as beliefs, affect and intentions, influence travel behaviour (Ajzen and Fishbein, 2000; Ajzen, 2011; Stern et al., 1999; Triandis, 1977), as does one's social context or situation (Murtagh et al., 2012a; Griskevicius et al., 2008; Axsen, 2010).

The interplay of social - psychological and situational factors in travel decision making has been somewhat considered by quantitative studies such as Hannes et al. (2012). This study takes into account various factors such as, the choices available to an individual, mode related characteristics such as speed, affective characteristics such as comfort and safety, in developing a model for mental representations. The model is focussed on structuring and quantifying mental representations of travel related decision problems. This mental model is based on a decision at a particular point in time. The current study proposes that social - psychological factors arise out of mental representations; and these mental representations are formed against a background of the existing situation and our experience of it or the vicarious experience especially of important reference persons. This experience is built over a life course and therefore these mental representations may change with the changing circumstances in the life course. These changing circumstances then become part of the experience drawn upon to adjust mental representations. The interplay of the social - psychological variables with the situational factors in the mental structure that surrounds an individual's travel decisions throughout their life course has not been explored.

1.3 The Travel Script Concept

Through qualitative analysis of the narratives of 82 commuters, this research proposes that the interplay of the social - psychological and situational factors, in decision

making, occurs at a mental level; as a knowledge structure in one's mind. The concept of a script is drawn from Schema theory to explore this mental representation. Before defining a travel script, it is necessary to understand how Schema theory treats mental structures. Schema theory proposes that people have schemata about everything, that is, mental structures that we use to organise and simplify our knowledge of the world around us (Gioia and Manz, 1985); allowing us to filter, accentuate and downplay various elements to enable us to allocate meaning and interpret situations. A schema can be considered as a generic knowledge structure in memory (Graesser and Nakamura, 1982). Schemas affect and direct the perception, storage and activation of information in the world, to provide an individual with past experiences and the knowledge about the action for a specific task (Neisser, 1976). Gioia and Manz (1985) note that most types of schemas - for example, stereotypes, prototypes and frames - are systems for categorising and interrelating information. They are cognitive frameworks for understanding that suggest implications for behaviour but not generally considered as guides to behaviour. A script, on the other hand, is a more dynamic schematic knowledge structure that retains knowledge of expected sequences of behaviours and events. It is concerned with understanding the behaviour of self and others; and guiding one's behaviour in specific situations or contexts. Abelson (1981) defines a script as a hypothesised cognitive structure that when activated organises comprehension of event - based situations. For example, a driving script would organise the knowledge of traffic signals and awareness of the actions of other road users around you to guide behaviour on the road. A script for a particular journey such as a commute not only involves the information regarding the actual travel to the destination but also, the available travel mode options and their characteristics such as speed or carrying capacity. It would also involve knowledge on the ease of getting to the destination with a particular mode, that is, the infrastructure on the way and at the destination, as well as attitudes towards travelling by the different modes. All this would be part of the mental structure used to guide the decision of how to travel.

A travel script, therefore, can be conceptualised as a mental structure or representation of the individual's knowledgeability of the structures within which they are situated; which when activated organises the comprehension of the travel decision and gives meaning to the action. Travel knowledgeability may include knowledge and perception of different resources, modes, time and distance for travel, adequacy of modes for different journeys, and the social norms surrounding travel

behaviour. People tend to monitor and develop their script to satisfy certain needs, preferences or interests. The meaning associated with the travel behaviour is therefore based on the achievement of a desired goal, for example, arriving within a certain time, avoiding hassle associated with different modes or acting in line with one's convictions. Script development and long term retention are facilitated by factors such as the functional importance of the behaviour, frequency of repetition and the degree of self or external reinforcement experienced. Gioia and Manz (1985) note Abelson's progression of scripted behaviour through three evolutionary levels as elaborated below:

- Episodic script: This is retained as a context specific understanding of a single event or experience. The instances of travelling to different locations of work, for example, would be different episodes of travel to work; as would travel straight to work as opposed to travel to work combined with a school run.
- Categorical script: This is formed when similar episodes in similar situations are experienced allowing for the evolution of a script for a narrow class of situations. Daily travel to a particular place of work over time would be considered similar episodes of a script.
- Hypothetical or generalised script: This evolves when enough experience is acquired and can be generalised across contexts. The generalised script serves as a "meta-script" to guide behaviour in a range of related situations. Daily travel to work over a period of time and with relatively stable external and personal factors creates the context within which a script can be generalised.

Script evolution therefore progresses from the concrete to the abstract and the generalised script implies the organisation of behavioural knowledge into some meaningful structure. This study will consider how this hypothetical or generalised script, with a particular focus on commuting behaviour, could be constructed and engaged.

1.3.1 Engaging the Travel Script

Travel behaviour literature speaks of a "value - action - gap": a situation whereby the values or attitudes such as intentions to travel with more sustainable modes do not translate into actual behaviour. Kollmuss and Agyeman (2002) suggest three types of models that aimed to explain this gap - also known as the "attitude - behaviour - gap": linear models based on amount of environmental knowledge; altruistic and empathetic models; and sociological models. Earlier models from the early 1970s attributed it to the

amount of environmental knowledge people possessed. This knowledge was thought to arouse environmental awareness and concern which was in turn thought to lead to pro - environmental behaviour. Research later proved these models wrong (O'Neill and Hulme, 2009; Staats et al., 1996; Steg, 2008; Whitmarsh et al., 2011). Other models suggested that stronger altruistic or empathic tendencies produced more pro - environmental behaviour. Stern et. al (1993) for example, proposed that environmental concern was a combination of three orientations: egoistic; social and biospheric. These orientations were said to be concerned with the removal of suffering from oneself; from other people; or from the non - human world respectively. Sociological models included a broader range of sociological and psychological factors such as environmental attitudes, environmental knowledge and incentives for pro - environmental behaviour, to explain pro - environmental behaviour or the lack of it. Drawing on those models, it can be argued that the goals achieved by the engagement of a particular script are situation specific and therefore may not always be in line with general environmental values or attitudes. For particular situations, certain aspects such as traffic congestion or a longer commute may be downplayed; and others such as comfort or control of the situation may be accentuated to achieve that goal.

Other researchers have attributed the value - action -gap to the inadequate consideration of affective beliefs, social symbolic beliefs and habitual motives in research studies (Avineri, 2012); and the high cost of behaviour such as travel behaviour, where the serious adjustment required of individuals' lifestyles prevents them from acting according to the values held (Thøgersen, 2006; de Groot and Schuitema, 2012; Diekmann and Preisendörfer, 2003). All this suggests that just because an individual has knowledge about something does not necessarily mean they will act in accordance with that knowledge.

In addition to the explanations for the value - action - gap above, the process of deciding to act based on that knowledge or not involves cognitive demand or mental effort. The fields of psychology and economics have long accepted that actions are selected so as to minimise effort and that humans are "cognitive misers" (Kool et al., 2010). In other words, in decision making, there is always an aspect of judging the mental effort of the decision process, usually towards minimising effort.

It is therefore highly likely that in engaging the travel script as a guide for travel behaviour, an individual will judge the mental effort required. It is proposed that this

judgement of effort is itself a social - psychological factor as well as a meaning making mechanism for a specific commuting behaviour. In line with the judgement of mental effort, certain needs, preferences or attributes are filtered and accentuated to achieve a particular goal for the commute. In investigating the judgement of mental effort, the research will not confine itself to the stand of psychology and economics - that actions are driven by economisation of effort only, but will also be open to other manifestations of effort that may arise from the data.

1.4 Theoretical Framework

Everyone who has attempted to interpret human activities has been obliged to use the concept of structure (Lizardo, 2010) in one way or another. Classical sociologists such as Emile Durkheim, Karl Marx and Max Weber proposed approaches to the study of human activities that emphasised either the external structure over an individual's agency or vice versa. Durkheim, for example, believed that to study social life, one had to examine the social currents and underlying patterns of social activity rather than the individuals (Goodman, 1992). He saw these underlying currents as having a coercive power that individuals were normally unaware of. Marx also emphasised structure over agency. In Marxian theory, social structure is characterised by who owns the property and means, and who works in the production process. Marxian theory proposes the pre - eminence of the economic institution over all other institutions. Unlike Marx and Durkheim, Weber did not believe that structures exist external to the individual but that individuals, acting freely can bring about transformation through their ideas, values, beliefs and motivations. Weberian theorists therefore emphasised agency over structure by focussing on social action and the meaning that individuals associate with these actions in constructing social order. Contemporary theorists such as Pierre Bourdieu (2010; 1979), Berger and Luckmann (1966) and Anthony Giddens (1984) have attempted to reconcile structure and agency.

This research's exploration of the link between situational and social - psychological factors in influencing travel behaviour necessitates the consideration not only of the concept of structure but more importantly, its interaction with agency. In the sociological debate regarding the importance of structure or agency in determining social phenomenon, this study is more aligned to the popular approach that stresses the complementarity of structure and agency rather than the approaches that emphasise one over the other. Giddens' (1984) Structuration theory is used in this study as the

overarching basis upon which the interaction of situational and social - psychological factors in travel decisions is explored.

The appeal of Structuration theory for this research was in its proposal, not only of a dynamic relationship between societal structures and an individual's capacity and will to act; between the micro - level activity and the macro - level aspects in social life; but also that this dynamic relationship is ordered across space and time. This study proposes the travel script as the link between situational and social - psychological factors. The ordering of the dynamic relationship of structure and agency across time and space is therefore important in light of the fact that the travel script is expected to be constructed and develop as an individual's life course progresses.

Structuration theory looks at the reproduction of social systems; at the modes in which such systems, grounded in the knowledgeable activities of situated actors, who draw upon rules and resources in the diversity of action contexts, are produced and reproduced in interaction. The theory has been criticised as being unclear about what should be described as social structures or systems, that is, whether as patterned activities by several actors; or patterns of relations; or as a number of social practices put together (Archer, 1982; Bryant, 1992; Sewell, 1992). While this is a valid criticism of the theory, its resolution is not essential for the use of this theory as the basis of this research. This research is not looking so much at describing a particular social system produced and reproduced, but at the way in which the interaction of structure and agency in commuting decisions changes across a lifetime - thus providing a way to explore the changing interaction between situational and social - psychological factors. The conceptualisation of the elements of the theory such as structure, agency and knowledgeability offers an adequate theoretical basis upon which to look at the structure - agency relationship with regard to travel behaviour along a life course. The following discussion reflects on the relevance of these elements, as conceptualised in Structuration theory, as well as their limitations for this study.

1.4.1 Knowledgeability

Knowledgeability refers to wisdom evidenced by possession of knowledge. In other words, knowledgeability is not only concerned with the knowledge people have, but also how they choose to use that knowledge and any consequences they perceive to be arising from acting based on that knowledge. Giddens (1984) notes that while the knowledge people possess is integral to the patterning of social life, it is always

bounded and situational. There are always unintended consequences to actions which form unacknowledged conditions of action in a feedback fashion. He further notes that the knowledgeability of individuals is reflexive and therefore influences the recursive ordering of social practices. Section 1.3, for example, noted travel knowledgeability as including knowledge and perception of different resources, modes, time and distance for travel, adequacy of modes for different journeys and the social norms surrounding travel behaviour. All or some of this knowledge can be drawn upon by an individual to assess their situation and, say, decide that commuting to work via a newly constructed road would be faster due to fewer cars. Overtime, this new road might become congested - a condition contributed to by the individual - possibly causing a re-evaluation of how they should commute. The congestion is an unintended consequence, but the experience of it contributes to the individual's knowledgeability, which through reflection might lead to a different course of action. This concept of knowledgeability is important as it shows individuals drawing from their situation, information which is used in their decision making. That knowledgeability is bounded, and thus imperfect, leading to unintended consequences is even more relevant for this research. Since commuting is a repetitive behaviour, there is a high chance of habits forming. This research postulates that this habit can be an unintended consequence of the commuting decision, which would in turn influence subsequent commuting decisions, due to the reduced cognitive effort.

1.4.2 Structure

The definition of the concept of structure and the description of what structures are has been a contentious issue in the social sciences. Theorists such as Radcliffe-Brown saw structures as concrete, possessing form as seen at a moment in time; while others like Levi Strauss saw structures as abstract models built up after reality of what is observed as repeated and persisting (Lizardo, 2010). These abstract models would therefore be methodological tools to represent the situated actions of a social agent. As noted in Section 1.4 above, Giddens' Structuration theory does not describe what structures might look like as Radcliffe-Brown does. Structures are conceptualised not just as seen at one point in time, but as dynamic processes of generation, reproduction and interaction over time. In other words, even though it is not clear what the structure looks like, it is proposed that it is the principles that pattern recurrent practices.

Viewing structures as models allocates them a virtual nature, an idea shared by Giddens. However, Levi-Strauss' conceptualisation of the models representing structures as

methodological tools has been said to dissociate questions on structure from questions on agency. Here, the emphasis is placed on the observed structure - from which the models are created - rather than the agency that could be argued as influencing that which has been observed. Structuration theory proposes a **duality of structure** (Giddens, 1984) that is, that structures are both the medium and outcome of the practices that make up social systems; that structures shape people's practices but it is also people's practices that constitute and reproduce structure. The theory also proposes a **reflexivity of structure and agency** in the creation of social systems. In other words, there is a circular relationship between structure and agency such that an individual's capacity to act within a structure not only expresses the structure but also helps to construct the structure. The structure in turn constrains or enables this capacity to act. This supports the concept of the changing travel script along an individual's life course. The travel script is conceptualised as a mental structure of the individual's knowledgeability of the structures within which they are situated. Individuals draw from this mental structure to guide behaviour. It is from observation of this behaviour that the mental structure or travel script behind it is glimpsed. Furthermore, the action of the individual facilitates reflection on the knowledgeability leading to changes in the mental structure with time, even when situational factors such as distance and resources remain constant.

The criticism that Structuration theory is unclear as to what a structure really is, coupled with the reflexivity of structure and agency may lead to a situation where the line between structure and agency is blurred. While in reality, this line is indeed likely to be blurred, this could create a methodological problem for the research, specifically in deciding which concepts or themes to analyse under structures and which under agency. However, the elaboration of the concept of structures as a set of rules and resources existing as memory traces and instantiated in action, helps to delineate this methodological line. These rules and resources are used to guide the analysis in this research in identifying the components of the mental structure. The different make up of these mental structures or travel scripts along the life course would help to illustrate the dynamic nature of structures.

Sewell (1992) elucidates the statement that "structures are a set of rules and resources existing as memory traces and instantiated in action" noting that structures are the principles that pattern actions and they exist as schemas in the mind and as they are put into practice. In other words, structures exist in the things we know and the way we put

them into practice. Preferring the word “schemas” in place of “rules”, Sewell concurs with Giddens that schemas are virtual generalizable procedures that guide our behaviour, such as, time, distance and family situation considerations in commuting. They are generalizable in the sense that they can be put into practice in a range of different circumstances. The structure surrounding the decision of how to travel is, therefore, not simply a material component outside of the individual, but a schema of all the things they know, for example, knowledge of situational factors and other personal experiences such as key events along a life course. It is important to note that because knowledgeability is bounded and situational, not all the things known at the time of decision making are drawn upon to make the decision.

Resources are viewed as anything that enables agency; they enable the capability to act in social interactions. Giddens divides resources into authoritative or allocative depending on whether they refer to transformative capacity over persons or objects respectively. Sewell (1992) simplifies this classification as human resources such as physical strength, knowledge and emotional commitment; or non-human resources which are any objects that may be used to enhance or maintain power, for example, owning a car, having access to near and quick public transportation. These rules and resources make up “the things we know”. They are the knowledge of the existing situation and personal or vicarious experience upon which a schema or mental structure or script is based.

1.4.3 Agency

Giddens (1984) conceptualises agency not as the intentions people have in doing things but in their capability of doing those things in the first place; the exercising of some sort of power. He proposes that an individual’s action involves three aspects: reflexive monitoring; rationalisation of action; and motivation of action. The capability of an agent can be argued to be influenced by the knowledgeability of the actor as well as their self - efficacy. The knowledgeability of individuals was noted as being reflexive. This is important for the concept of the travel script because, while the travel script is conceptualised as developing unconsciously, it can be reflected upon through the monitoring of the ongoing flow of social life. Giddens proposes that reflexivity presumes the monitoring of the ongoing flow of social life; not only our own but those expected from others. Reflexive monitoring of actions involves rationalisation which allows individuals to maintain a continuing understanding of the grounds for the

activity. Motivation, unlike reflexive monitoring and rationalisation, is not directly related to the continuity of the action. It relates to the conscious or unconscious wants or preferences that prompt the action.

Repetitive actions such as commuting can be seen as a source of knowledgeability, and by virtue of their repetitive nature allow for reflexive monitoring and rationalisation. A travel script is therefore expected to change if the conditions being monitored change. That is, through the reflexive monitoring of the different key events such as the start of a new job or a family along a person's life course, the travel script is expected to change. Giddens argues that through the reflexive process, the individual seeks out and defines their self - identity. This self - identity, like motivation, may not necessarily be directly related to the continuity of an action but is a more general concept within which a range of conduct is enacted. Self - identity could arguably be considered as one of the underlying factors behind motivation. Studies such as Jensen (1999) and Anable (2005), have in fact identified certain mobility types or identities that underlie travel behaviour.

The concept of self - identity is important for this study because it inevitably develops as an individual's life course progresses. The changing factors that would make up or influence the engagement of different travel scripts along a life course might therefore also affect the self - identity sought out and defined by individuals, or vice versa. In addition, this concept of self - identity is agent specific; it considers how an individual views him or herself, and how this view empowers action. It is therefore an important concept in the analysis of agency. The factors that help define an individual's self - identity are therefore considered by this research as articulating the agency of individuals as they engage the travel script.

Agency as conceptualised in Structuration theory considers knowledgeability and its reflexive monitoring. However, not much is proposed about the processes of incorporating different elements of this knowledgeability into an individual's mental structure in order to be able to reflect on it to guide behaviour and in the longer term define their self - identity. Identity Process Theory (Breakwell, 2015, 2010, 1993), discussed in the following section is drawn upon to bridge that gap for this research.

1.5 Identity Process Theory

Identity Process Theory proposes that an individual's identity is a dynamic social product of the interaction of the capacities for memory, consciousness and organised

construal with the physical and societal structures and influence processes which constitute the social context (Breakwell, 2010). This dynamic approach to the concept of identity was the main allure of this particular theory of identity for this research because of the life course approach that is being taken. In addition, the proposal that memory and consciousness together with the social context are the factors for the development of identity seems to echo Giddens' postulate that self - identity is defined through a reflexive process.

Due to time constraints, that is, being unable to follow an individual through a substantial period along their life course, and utilising retrospective information instead, this research will in particular use the expression of identity as a window into the evaluation of the identity already formed. Individuals develop their identity over time and express it through different actions and behaviours. Commuting behaviour can, therefore, be considered as one of the many expressions of identity. These actions and behaviours can be said to manifest a mental process through which identity is developed and expressed.

Identity Process Theory proposes that identity resides in psychological processes but is manifested through thought, action and affect. This echoes Bandura's (2000) postulate that the impact of most environmental influences on human motivation, affect and action is heavily mediated through self - processes which give meaning and valence to external events. People are normally self - aware and actively monitor the status of their identity through their thoughts, actions, motivations and affect. If we consider daily travel, such as the commute, as part of the package through which we manifest or express our identity, then the changes in the situational or knowledgeability factors at different key events would form the different conditions that allow us to monitor the mental structure or travel script. This monitoring can be argued to be through self or psychological processes, akin to the reflexive monitoring and rationalisation proposed by Structuration theory.

The theory also describes identity in terms of its structure as well as its processes. The structure of identity is said to have a content and a value dimension. The content dimension consists of social - psychological factors such as attitudes, values and cognitive style. It was noted in Section 1.3 that the monitoring and developing of scripts was to satisfy certain needs, preferences and interests. These needs, preferences and interests will therefore be considered in this research as forming part of the structure of

an individual's self - identity. Each element in the content dimension is said to have a positive or negative value or affect attached to it, and collectively these values or affect constitute the value dimension of identity.

1.5.1 Assimilation - Accommodation and Evaluation

According to the Identity Process Theory, identity structure is regulated by two processes. Assimilation - accommodation, which are components of one process of the absorption of new components into the identity structure and the adjustment of the existing structure in order to find a place for new elements (Breakwell 2010; 1993). This process complements the consideration of the possible content of a travel script, suggested by Structuration theory. The analysis and discussion in this research will show the different rules and resources assimilated and accommodated into an individual's mental structure leading to engagement of different travel scripts. Due to the already elaborated time constraints and the fact that the life course in this research is observed retrospectively, this assimilation - accommodation process cannot be closely tracked to show the different elements as they are incorporated into the travel script or mental structure. This dynamic assimilation - accommodation process is therefore presumed by the changing content of the travel script at the different points along an individual's life course. In addition, the proposal of the content of an identity structure, above, as consisting of needs, preferences and interests, among other factors, broadens the knowledgeability upon which a travel script would be based. It would not only comprise a rules - resources set, but also the social - psychological factors to be satisfied by particular commute behaviours.

The second process - evaluation - involves the allocation of meaning and value to identity contents old and new. Breakwell (2010) notes that the value dimension of identity can change due to an individual's reappraisal of changing social systems and the modification of one's position in relation to these social systems. This complements the reflexive monitoring and rationalisation of an agent in Structuration theory. This research proposes that the needs, preferences and interests are evaluated and assigned meaning and value to satisfy a particular commute goal that would be in line with an individual's self - identity, as expressed in the commute behaviour. In addition, the discussion on the engagement of a travel script (Section 1.3.1) noted that, to engage a script, an individual also had to judge the amount of mental effort they are willing to spend in evaluating the script content. The evaluation of the proposed content of the

travel script is therefore expected to arrive at a judgement of mental effort that individuals are willing to expend as they satisfy the commute goals in line with their identities.

1.5.2 Coping Strategies or Mechanisms

In developing the Identity Process Theory, Breakwell concluded that one of the keys to understanding the processes that drive identity expression, is understanding how individuals respond when their identity is threatened (Breakwell, 2010). The assimilation - accommodation and evaluation processes are guided in their operation by four principles which determine the desirable states for the structure of identity. The principles are the desire for: continuity; distinctiveness; self - efficacy; and self-esteem. The four principles vary in their relative and absolute salience over time, across situations and developmentally across the lifespan (Breakwell, 2010).

A threat to identity would occur when the accommodation - assimilation process cannot comply with these principles. This is the fundamental tenet of the Identity Process Theory: that the self operates in compliance with certain guiding principles in such a way as to protect itself from threat (N. Murtagh et al., 2012b). A coping strategy is elicited to deal with the dissonance between the processes regulating the structure of identity and the principles defining the desirable state for the identity structure. Breakwell (2015) defines a coping strategy as any activity in thought or deed which has as its goal the removal or modification of a threat to identity whether it is consciously recognised as intentional or not. In this, it is clear that the coping strategy in this study is geared towards a specific commute goal - that of eliminating the threat to a particular expression of self - identity through the commuting behaviour. The coping strategy is determined by the interaction between the type of threat involved, the salient parameters in the social context, the prior identity structure and the cognitive and emotional capacities of the individual. The coping strategies may involve the reconstruction of meaning, denial of the existence of the threat, or some change that demonstrates the acceptance of the threat.

1.5.3 The Self - efficacy Principle

Breakwell (1993) notes that the relative importance of the guiding principles in dictating how the assimilation - accommodation and evaluation processes operate is undetermined and most likely situation specific. For daily travel behaviour therefore, being only a part of one’s expression of identity, it is not unexpected that not all these

principles are drawn upon to guide the construction and engagement of the travel script. This research focusses on the self - efficacy principle, especially on how it might guide the evaluation of attitudes and values towards achieving a commute goal, and the coping strategies used by individual.

The self - efficacy principle is noted as driving an individual to try to maintain an identity structure which is characterised by competence and control. Breakwell looks to Bandura's work on the concept to elaborate the principle. Bandura et. al (2003) propose that beliefs of personal efficacy influence how much effort people invest in selected endeavours, how they persevere in the face of difficulties, how resilient they are to adversity, and what types of choices they make at important decisional points that set the course of life paths. Beliefs of personal efficacy are therefore relevant for this research as their analysis would complement the analysis of the judgement of mental effort. Efficacy expectations determine how much effort people are willing to expend and how long they persist in the face of obstacles (Bandura, 1977). Efficacy expectations have also been closely linked to coping strategies. They affect both initiation and persistence of coping behaviour. Bandura (1977) adds that the strength of people's convictions in their own effectiveness is likely to affect whether they will even try to cope with given situations. Perceived self - efficacy can therefore also influence the choice of behavioural settings. Bandura proposes the following factors as influencing efficacy expectations:

- Mastery experiences; whereby the continual performance of an action successfully increases one's belief in their ability to successfully perform the action.
- Vicarious experiences; experiences of people similar to oneself or to whom we aspire can serve as cues as to our self - efficacy expectations.
- Social persuasion; successful efficacy builders do more than just convey positive appraisal but structure situations to enable success.
- People can also rely on their emotional state, stress or mood to judge their efficacy.

These factors allow the addition of another layer of analysis to the judgement of mental effort. For example, it will be interesting to compare the mastery expectations or the structuring of situations to enable successful commuting by individuals that exhibit different judgements of mental effort.

1.6 Research Aim and Objectives

The aim of this research is to investigate the travel script as the link between situational and social - psychological factors in travel decisions throughout an individual's life course. There are two overarching objectives to achieve this:

1. **To explore how commuters above 30 years` constructed travel scripts along their life courses.** This objective is underpinned by the following research questions:
    a. What combination of knowledgeability factors is available to the individuals in the development of a travel script?
    b. How are these factors assimilated and accommodated into the travel scripts at different key events along an individual's life course?
    c. How do these factors constrain or enable commuting behaviour?
    d. How do the travel scripts for those currently commuting by car differ from those currently commuting by alternative modes, along the life course?
    e. How do the travel scripts differ among different cohorts?
2. **To explore the engagement of a travel script at turning points along individuals' mobility biographies**. The following research questions guided this exploration:
    a. What are the possible turning points in the mobility biographies for different cohorts; and the different current default commute modes?
    b. How does the perception of the knowledgeability factors affect the evaluation of the mental effort applied to engage a travel script at the turning points?
    c. How does the evaluation of mental effort validate certain identities?
        i. How are commute goals related to the evaluation of mental effort to engage a travel script?
        ii. What needs, interests or preferences are accentuated and downplayed to filter out meanings for the commute goals during the process of evaluation of the mental effort to engage a travel script?
        iii. What coping strategies are used to evaluate the threat to the meaning attached to the engagement of a particular travel script which satisfies a desired state of identity?

1.7 Conclusion and Structure of the Thesis

The purpose of this study is to assess how individuals make their travel decisions; the factors that influence this decision making and how these factors contribute to the process of behaviour change throughout an individual's life course. In particular, the study proposes the travel script as the link between the influences of situational and social - psychological factors in commuting decisions throughout an individual's life course. Chapter One has presented the background to the research and noted the interplay of the social - psychological variables with the situational factors in the mental structure that surrounds an individual's travel decisions throughout their life course as a gap in the research. The travel script is noted as this mental structure. Concepts from Structuration theory (Giddens, 1984) such as knowledgeability, duality of structure and reflexivity of structure and agency are presented as a theoretical framework to guide the exploration of this mental structure; together with concepts from Identity Process Theory (Breakwell, 1993) in particular, assimilation - accommodation, evaluation, coping strategies and self - efficacy.

Chapter Two discusses the general development of transportation policy in Europe towards the current policy approach, where the individual is seen as the main driver of behavioural change and supported to do so. It traces transportation policy from that focussed on building more roads (Headicar, 2009) to connect people to places, to one that acknowledges the social and environmental impacts of the road building program and therefore starts to consider modes other than the private car (Banister, 2002). To foster a shift to alternative modes, policy starts to adopt strategies that might encourage and facilitate behaviour change out of an individual's personal choice (Brög et al., 2009; Goodwin, 1999).

With the individual noted as central to travel behaviour change, Chapter Three presents the immediate situational factors individuals undergo along their life courses such as changes in location (Scheiner and Holz-Rau, 2007), transportation infrastructure (Beirão and Cabral, 2007), household (Lanzendorf, 2010) and income changes (Dargay, 2007). The perception of the impact of these situational factors is noted to be bounded by key events such as changes in the family, employment and residence (Lanzendorf, 2003; Van Acker et al., 2010). The chapter also presents social - psychological factors such as beliefs and attitudes (Ajzen and Fishbein, 2000; Bem, 1967), habits (Schwanen et al., 2012; Verplanken et al., 1997) and perceived self - identities (Gatersleben et al., 2014).

The social - psychological factors are proposed as arising out of the situations and also creating or reinforcing some of the situational factors. The chapter emphasises the inter-relatedness of all these factors in influencing a travel decision.

In Chapter Four, the research methodology is presented highlighting again the positionality of the research as a qualitative study within a constructivist and interpretivist epistemology. A case is presented for the suitability of the life course and narrative approach (Giovannoli, 2000) to data collection (Bauer, 1996; Wengraf, 2013) and analysis. In particular, Schutze's method of narrative analysis is elaborated upon as it is best suited to analysing large amounts of qualitative data (Schutze, 1983; 1977 cited in Jovchelovitch and Bauer, 2000). The chapter then describes what was done to collect and analyse data. The indexical data analysis, proposed by Schutze's narrative analysis approach as the first step before in-depth thematic analysis, is presented. It involves mining discrete information from the data to enable the formation of groups or life course trajectories. In general, the data is split into two groups representing the current default commuting mode, as either the car or alternative modes. It is further split along key life cycle events and cohorts based on when respondents were old enough to drive. It is on these groups that an in-depth thematic analysis was carried out and the results presented in Chapters Five, Six and Seven. Chapter Four also presents and explains a sample travel script as conceptualised by the researcher.

Chapter Five seeks to answer the first objective which looks at how the travel script is constructed. The chapter notes that individuals are exposed to a number of situational factors and therefore experience and form attitudes related to the travel behaviour, the mode, the locations of different activities, etc. All these are assimilated and accommodated into one's mental structure. A generalised travel script is formed through evaluation these factors. The chapter therefore presents the knowledgeability factors, that is, the situational factors and the key events along a life course that bound these factors, as the components of a travel script. The key events discussed are: further education; first job; having children or starting a family; moving to current home; and moving to current job. It discusses how these factors enable and constrain commuting at different key events, such that at each event, different factors are accentuated or downplayed in the travel script, leading to a difference in commuting behaviour at different periods of the life course. In this chapter, the concept of structure as a rules - resources set is illustrated. The knowledgeability factors mentioned form these rules - resources sets, and constrain or enable commuting behaviour. The reflexivity of

structure and agency is demonstrated by the changing travel scripts at different key events along the life course. This suggests that individuals' travel scripts or mental structures evolve through reflexive monitoring and rationalisation of the changing knowledgeability factors; and it is these travel scripts that are drawn upon to guide commuting behaviour.

Chapter Six considers when the knowledgeability factors may contribute to a turning point in the commute mode along the life course. It aims at answering part of the second objective which is about the engagement of the travel script. It looks at the sequence of mode - related and life - cycle events and considers: the turning points for each collective trajectory; and the perception of knowledgeability factors in the travel scripts surrounding the turning points. A certain amount of mental effort is required to evaluate the myriad of knowledgeability factors and the commute. Chapter Six, therefore, also offers some insights into the differences in the judgement of the mental effort applied in bringing about and sustaining the changes in the commuting trajectories. This difference in judgement of effort suggests that individuals do not only exercise their agency through reflexive monitoring of the knowledgeability factors but also through motivation by latent factors such as self- identity.

Chapter Seven uses the criterion of judgement of mental effort, identified in Chapter Six, to show that the accentuating and downplaying of needs, preferences and interests to satisfy commute goals, at the turning point and later, is done in such a way as to be in line with the corresponding identity group. This supports the suggestion in Chapter Six and demonstrates more clearly that motivation through latent self - identity is a significant aspect of exercising agency. The identity groups proposed are: those that economise mental effort; and those with "an extra little thing in the system". Chapter Seven also answers Objective Two but looks in particular at how the evaluation of mental effort in validating certain identities, motivates the engagement of a particular travel script. The evaluation of mental effort is discussed by considering: the commute goals related to each identity group; the needs, interests or preferences accentuated or downplayed to filter out different meanings, in line with the perceived self - identity for these goals; and the coping strategies employed when a desired state of identity, satisfied and expressed by a particular travel script, is threatened. The goals are grouped into three categories: cost effectiveness, timeliness and control, and comfort.

Chapter Eight brings together the discussions in Chapters Five, Six and Seven. A persona is created from each collective trajectory and used to discuss the formation, development and reinforcement of the travel script along a hypothesised life course. By presenting this synthesised information as the experiences on one individual, a holistic and deeper understanding of the travel script as the link between situational and social - psychological factors is given. Chapter Eight in particular emphasises: the interdependence between the situational factors and the social - psychological factors at both the turning points and later; and the fact that this interdependence seems to be mediated by the facet of self - identity being expressed by the commuting behaviour. This is used to demonstrate the duality of the mental structure.

Chapter Nine wraps up the thesis by presenting: a summary of the research findings with emphasis on how they answer the research objectives; the contribution to travel behaviour literature, in particular the use of concepts from Structuration theory and the contribution to literature on mobility biographies, travel habits and travel identities; the implications of the findings for policy with emphasis on extensive infrastructure for public transport and active modes, and the patient, concerted effort needed to achieve a culture change; and the limitations of the research including methodological limitations and areas of further research that were left unexplored.

Chapter 2: Economic Rationality in Transportation Policy

2.1 Introduction

The discussion in Section 1.1 in the previous chapter noted a shift in transportation policy towards encouraging behaviour change. Understanding the interplay of different factors, such as the link between situational and social - psychological factors being explored in this research, was also noted as necessary for supporting this policy approach. This chapter traces the general development of transportation policy in Europe from one that focussed on the creation of the "right" external situation to enable travel behaviour to one which looks at the individual as the main driver of change. In particular, the chapter traces the changing focus of transportation policy from:

- The 1960s approach that emphasised the building of more roads to support a future envisioned as dominated by the car
- To the 1970s and 1980s approach that acknowledged the social and environmental impacts of the road building program and therefore, starts to consider and even support modes other than the private car
- To the current policy focus that is starting to adopt strategies that might encourage and facilitate behaviour change out of an individual's personal choice.

Policy is formulated to advance a desired outcome. Transportation policy's main desired outcome is to increase accessibility - the ability to reach goods, services and activities. Measures to increase accessibility are partly based on assumptions about human behaviour and how people make decisions. Since the 1950s, assumptions based on a narrow view of "homo oeconomicus" or economic rationality in decision making has dominated transportation policy. This chapter's discussion of the economic rationality slant of UK transportation policy through the decades is aimed at illustrating the possible impact of tunnel focus on the macro - level social situation.

The chapter starts by defining "homo oeconomicus" as used both in economics and in predicting human travel behaviour in transportation planning and policy. By comparing and contrasting transportation policy of the United Kingdom and other European countries, the discussion shows how these narrow assumptions of economic rationality contributed to more car dependency in the UK compared to European countries such as the Netherlands, Denmark or Germany. The chapter culminates with the rise of the

sustainability development agenda which brings with it a shift from sole reliance on economic rationality assumptions to the consideration of alternative influences on human behaviour and decision making.

2.2 Who is Homo Oeconomicus?

Homo oeconomicus, in economics, is an agent with given preferences pursuing his self - interest, seeking to do the best he can, given his opportunities (Vriend, 1996). In this, we see a quality of rationality in the behaviour of homo oeconomicus - a general tendency to align beliefs and actions with certain reason. He engages in economic behaviour, that is, he searches among his opportunities and preferences and chooses the most advantageous based on his perceived opportunity set. All perceived costs and benefits are taken into account including information, decision making and transaction costs. This has come to be known as economic rationality. It is important to note, that classical and neoclassical economic discourses, in characterising the behaviour of homo oeconomicus emphasised the role of preferences and perceived opportunities. The notion of rationality as an economic explanation is more recent and arose around the 1960s (Arrow, 1986).

As different fields started to apply the economic approach to human behaviour, rationality was given an independent explanatory role (Vriend, 1996). Due to the weakness of the rationality hypothesis, researchers in different fields supplemented it with strong assumptions to make it useful (Arrow, 1986). In transport planning and policymaking (as with other areas of policymaking), the following assumptions of economic rationality dominated:

> **Internal consistency of choices:** This assumption placed specific conditions on the pattern of an individual's preferences, such that choices, which were a manifestation of the most advantageous option chosen, were required to be consistent with each other. Underlying this assumption was the notion that to maximise utility, preferences could be ranked and this ranking had to be consistent in different situations. Since preferences and perceived opportunities are expected to change with time, this assumption was a departure from the emphasis of classical economics on the consistency of choices, not with one another but with preferences and perceived opportunities.

Homogeneity across individual agents: This assumption is rooted in the rational expectations models which aim to obtain internal consistency in aggregate models. In a market structure, this would allow demand to be matched to supply. To achieve equilibrium, it is assumed that individuals, being rational, would share preferences, because they share opportunities (in terms of market information, for example). In light of the consistency of choices assumption therefore, a group of individuals would be expected to demand the same thing. The rational expectations models allowed for prediction of future demand, and where it exceeded supply, governments could put in place measures to match future supply with demand.

Implicit in these two assumptions was a further assumption that there is one unique equilibrium state, one optimum solution. In addition, there was the sense in transport planning that the market could be brought to operate in allocating space for transportation modes. The preceding discussion presents how these assumptions of economic rationality have underpinned transportation policy specifically in the UK, from the 1960s to date. The comparison with other European countries is used to demonstrate how a change in these assumptions, even though still anchored in economic rationality, led to a divergence in transportation policy between the UK and these European countries.

2.3 The 1960s: Predict and Provide

The transport planning process in the UK in this decade was concerned with welfare; planning and availability of transport for all. 15 years on from the end of the second world war, the economy in Britain was growing, petrol rationing had ended, cars were becoming cheaper and the number of licenced vehicles in Britain had increased from 4.5 million in 1950 to over 9 million by 1960 (Gunn, 2011). The assumptions of internal consistency of choice and homogeneity of individual agents are apparent in the view, at the time, that the car was an agent of personal liberation for ordinary people (Hall, 2004). Private car use was therefore expected to increase while public transport would decrease (Goodwin, 1999). This decade, together with the 1950s, mark the beginning of the "predict and provide" era, whereby, drawing on the rational expectations models, transport planners sought to match the expected growth in traffic with provision of more road space. The decline of public transport and active modes of travel which had been prevalent before the Second World War seems to have been accepted to some extent as

a consequence of “progress”. In 1963, for example, the Beeching report was published and proposed the closure of a number of railway lines to stem losses incurred by British Railways. In order to allow the market to operate, the solution seemed to lie in balancing utilities with costs and so operation of underused railway lines was deemed unnecessary.

The assumption of one equilibrium state to aspire towards was apparent in the vision that progress would go hand in hand with dependence on private cars. For example, new towns such as Milton Keynes were designed around the car. In this period, congestion in the cities was considered the main disadvantage pertaining to the growth of car ownership and use. The solutions proposed included the Buchanan report in 1963 and the 1964 Smeed report. The Smeed report proposed road pricing as a deterrent for increased traffic and hence congestion. A similar proposal - congestion charging - was advanced by economists Beesley and Roth. The idea of allowing the market to operate was clear in these pricing mechanisms. They sought to manipulate demand by introducing a constraint which was presumed to be equal in value to the negative externalities caused by traffic. These pricing mechanisms were unpopular and there was no political will to implement them.

The Buchanan report, on the other hand, was well received by politicians. Commissioned by the minister of transport, Ernest Marples, as a study on the problem of traffic in towns, the report transmitted a conservationist agenda, and confronted how to fit an expanding number of vehicles into old cities that were previously not designed for the car (Gunn, 2011). The main concept in the Buchanan report was that of “environmental areas”. In areas where human activity like living, working and shopping occurred, certain environmental standards such as maximum noise levels and pollution were proposed. Beyond these standards, economic trade-offs were deemed possible if the town were both financially able and willing to admit more traffic while observing the norms (Hall, 2004). The Parliamentary secretary for the Ministry of Transport addressed the House of Lords in November 1963 and highlighted four ways in which the government would implement suggestions from the Buchanan report:

- Traffic surveys were commissioned to determine the future demand of transport
- Local authorities were to be organised in such a way as to enable them to make their own decisions about traffic and quality of urban life, with a government urban planning group to guide them

- Increased spending on urban roads
- Through area transport surveys, the government proposed to evolve a system of public transport by road and rail in cities which would meet the needs of the travelling public.

The idea of balancing the growing needs of traffic with the quality of urban life was welcomed and while the importance of public transport in enhancing the urban environment was recognised, the implementation still favoured provisions for the car. Funds for road construction were already earmarked and projects proceeding, which was not the case for public transport.

The assumption that the car was the future of transport and that its growth was well aligned with progress was not unique to the UK. Even the Netherlands and Denmark, currently ranked as the most bike - friendly countries in Europe, experienced a growth in private car use following the end of the Second World War. Gossling (2013) notes that car use surpassed bicycle use in Denmark in the 1960s. In the Netherlands until 1960, the number of passenger kilometres travelled by bicycle was greater than by car. Bicycle use declined sharply thereafter partly because of mass motorisation and the fairly uncoordinated process of urbanisation (Directorate-General for Passenger Transport, 1999). These countries in mainland Europe undertook strategies similar to the UK in trying to balance traffic demand with supply. The Netherlands in 1965 developed a new fund for financing road construction. A 'Main Road Network Structure Plan' was put forward in 1966 for long term planning mainly aimed at facilitating car traffic. In this time, the bicycle was given no attention by government policy. In Germany, it was not uncommon for most cities that bicycle tracks and paths from the 1950s and before the Second World War were removed to create parking for cars (Heath, 2001).

It can be argued that the assumption of homogeneity of individual agents attached to economic rationality drove most of the transport planning in this decade. Policy makers focussed almost solely on provisions for the car, allowing public transport and active travel to decline. The fact that preferences of individuals would inevitably differ was ignored. In addition, while trying to allow the market to operate, policy makers blinded themselves to the fact that emphasis on provision for one transport mode would inevitably change the perception of opportunities and possibly the preferences of the individual. In this decade, transport policy can be said to have helped individuals to

prefer private car use over public transport and active modes, both in the UK and other European countries.

2.4 The 1970s: At a Crossroads

The predict and provide approach to transport planning was fast declining in popularity at the beginning of this decade. There was growing concern about the environmental impact of transport and its social significance. For a brief moment, it seemed that UK policy makers had woken up to the weakness of the homogeneity assumption and the aspiration for one optimum solution for progress based on auto mobility. The transport debate widened to consider the role of public transport in catering for the needs of all those who did not have access to a car and for whom the road building orientation of national and local policies offered nothing (Headicar, 2009). The 1973 Urban Transport Planning report by the House of Commons' expenditure committee proposed a shift away from investment in roads to better management and use of existing resources (Banister, 2002). Its main recommendations included:

- Promotion of public transport including operating subsidies for public transport and introduction of bus lanes
- Traffic restraint including higher prices for parking, local authority control over off street parking and maximum limits on car parking spaces with new commercial developments
- Transportation studies focussing on how people could be deterred from travelling and how people might make use of improved public transport
- Organisation and financing of transport with greater emphasis given to social research and analysis of public attitudes in urban transport programmes

The recession caused by the 1973 oil crisis forced the government to give up some of its proposed spending. With the crisis came worldwide recession, rising inflation, inner city decline and unemployment. Investment in high quality roads and public transport infrastructure was deemed essential to prevent inner city decline (Banister 2002). While in essence, this was a regurgitation of the 1960s approach, there was emphasis on value for money at a time of reduced public spending. Subsidies for public transport and revenue support systems to enable local councils provide an efficient public transport system took a back seat.

The emphasis on value for money through evaluation models such as the cost - benefit analysis reveals a continued reliance on the assumptions of consistency of choice and homogeneity of individual agents. Social costs of projects were assigned a monetary value and fed into evaluation models which were used to choose the optimum solution from a number of alternatives.

The 1973 oil crisis seems to have been a crossroads for policy makers in most of Europe. Gossling (2013) notes that Danish cities like Copenhagen were forced to abandon large urban renewal projects focussed on auto mobility and promote cycling. He also calls attention to the importance of the fact that many Copenhageners had continued to cycle during the 1960s car boom. Wardlaw (2014) attributes the reversal of the long decline of cycling in Amsterdam and other Dutch cities in the mid - 1970s to outrage at the scale of road deaths, the 1973 oil crisis and the general public attitude that enough had been conceded to the motor car. Car traffic regulation and the promotion of public transport became political items of discussion in the Netherlands. Parking fees were levied in cities and the first residential areas where pedestrians had priority and car speeds were restricted were created. Cycling became more popular and bicycle use increased between 1976 and 1983. The Dutch Ministry of Transport in 1976 introduced two contribution regulations to increase social attention to the bicycle: one entitled cities to payment of 80% of construction costs for city bicycle facilities; and the other gave a 50% subsidy of construction costs for bicycle paths along existing secondary and minor roads for cities and provinces. In addition to support from policy, the still existing high level of cycling in the Netherlands in the 1970s may also have been elemental in the creation of the cycling networks. Heath (2001) notes, despite the miserable bicycle infrastructure and planning in German cities, bicycle use began to grow because of the high cost of fuel due to the energy crisis and increased motorised travel times due to traffic congestion. Unlike Denmark and the Netherlands where governments almost immediately started supporting active travel when the crisis hit, citizen initiatives and cycling organisations in Germany forced transportation authorities to begin a renewed effort to accommodate bicycles.

In this decade, unlike the UK, these European countries seemed to realise that there wasn’t just one optimum transportation solution focussed on the car. The subsequent support by policy of these alternative solutions related to active travel and public transport infrastructure would also have affected the perceived opportunities of individuals allowing them to choose a mode other than the car.

2.4 The 1980s: The Free Market Reign

A Conservative government was elected into office in 1979 bringing with it a radical change to the British transport industry. Previously, the efficient and equitable development of the utilities and other socially important industries was argued to be dependent fundamentally on planned action and expenditure by the state. The new government instead argued that the involvement of the state hindered progress and so state regulation was scrapped and these sectors opened up to the forces of the free market.

In 1983, the central government grant for transport expenditure was confined to capital spending only, thus, local bus services could no longer be subsidised. The 1985 Transport Act legislated for the deregulation of bus services outside London arguing that it would create more profitable services. This had the intended effect of encouraging more operators to enter the market and for companies to experiment with new services. In the conurbations, however, the reduced subsidies, lack of network coordination and instability of service patterns led to a 26% decline in patronage in the first 5 years (Headicar 2009).

The free reign given to the market and the insistence on non - interference by state may initially seem to respect the choice of homo oeconomicus based on his preferences and perceived opportunities. The naïve expectation that this free market was the road to progress, however, betrayed the underlying homogeneity assumption and the mistaken expectation of the emergence of an optimum solution through the invisible hand of the market. The differences in people's opportunities and their perception of them were ignored. For example, the actions driven by the goals of the suppliers of public transport seemed to undermine the courses of action needed to be taken by the public that demanded the transport, and so a structure was formed that inevitably made the car more desirable.

It is argued that the 1980s was the decade of the motorist with the costs of driving being significantly reduced, and company financing of motoring growing. At the same time, income and quality of life for those in employment was increasing. Therefore, with public transport becoming less reliable, it is unsurprising that there was a growth in car traffic of 40% over the decade. The 1989 National Roads Traffic Forecast and the white paper - Roads for Prosperity - predicted an increase in traffic levels of between 83% -

142% by 2025 (Banister 2002) and proposed a roads programme intended to curb congestion.

The Netherlands, Denmark and Germany in this decade continued their support for alternative modes of transport. Pucher and Buehler (2007) for example, note that the newly elected government of Amsterdam in 1978 focussed on cycling as an integral tool for solving the city's transport problems. Between 1978 and 1988, there was a 73% increase in length of bicycle paths from 9300km to 16100km compared to 11% increase to 101,000km for the total road network (Directorate - General for Passenger Transport, 1999). In 1989, a Bicycle Master Plan was developed and adopted in the 1988 Transport Structure Plan: Part D. This structure plan involved a well thought out location policy, restricting car use through selective expansion of road infrastructure, raising costs of car use compared to costs of other modes of transport and significantly improving alternatives to car use (Directorate General for Passenger Transport, 1999).

2.5 The 1990s to Date: The Rise of the Sustainability Agenda

In 1988, the Rees Jeffreys Road Fund - a sponsor of transport research - commissioned a series of reports from experts one of which was Goodwin et al's (1991) *Transport: The New Realism.* This report proposed that since there wasn't a possibility to match road supply with growth in demand due to induced traffic, demand had to be matched to supply. There was a shift from the implicit assumption that forecast traffic volumes should be catered for whenever possible, towards demand management as a key determinant in policy. This was the beginning of the end of the assumption of a car dominated future as the optimum choice.

At the same time, the sustainable development agenda was gaining prominence in intellectual debates. Following the 1992 Earth Summit in Rio de Janeiro at which the British government signed the convention on climate change, the Royal Commission on Environmental Pollution (RCEP) published a report in 1994 covering both the natural and built environment. The report proposed limiting of CO2 emissions from surface transport through increased fuel duty, reduction of the roads programme to the construction of bypasses where local need existed, and the financial savings transferred to public transport investment. The economic bust at the end of the 1980s allowed grounds for reducing public expenditure on roads. At this time, there was not only a less pressing need to grow the economy but also a need to increase revenues. Fuel duty was therefore increased by 10% and a fuel duty escalator by at least 3% till the year 2000

was introduced (Headicar, 2009). In 1996, the Conservative government published "The Way Forward", its paper on transport. The paper did not put forward specific proposals and made much of the value of economic instruments although the fuel duty escalator had been blunted by the falling cost of fuel itself. Nonetheless, the paper embraced a shift from road investment towards management.

Through the National Planning Guidance notes - PPG13 on transport - the government considered ways in which land use planning could be used to reduce emissions from transport. In the Netherlands, a proximity principle or the ABC strategy was employed to promote suitable locations with better access to public transport for employment locations. 'A' represented locations with good access by public transport; 'B' locations had both good access by public transport and access by the private car; 'C' locations were majorly accessible by private car. Similar to the Dutch ABC strategy, PPG13 was to promote development in urban areas and locate major generators of travel in existing centres which are highly accessible by means other than the car. In order to reduce the need to travel by car, planning had to ensure that location decisions of individuals and companies were closer together and within available facilities (Banister, 2002). The ABC strategy performed better than the PPG13 as funding mechanisms were closely linked with strategic planning enabling consistent application of development decisions across the country. In the UK, the dislocation between the national policy and investment provision means that the financial commitment to different initiatives is unclear. Interestingly, critics have considered the ABC strategy as too restrictive and not in line with market trends (Alpkokin, 2012). Nonetheless, there has been more financial commitment demonstrated in the Dutch policy compared to the UK policy regarding supporting public transport and active modes to become viable alternatives to the car.

With a change in government to Labour in 1997, there was constitutional reform embracing devolution from central government and the strengthening of regional decision making. Through the Scotland Act 1998, the Scottish Executive and a Scottish Parliament were created with power to make laws on a range of issues including some aspects of transport like the Scottish road network and bus policy. The Scottish Executive in 2004 published its first white paper on transport- *Scotland's Transport Future*. Its objectives included the promotion of economic growth, protecting the environment and improving health by building and investing in public transport and other types of efficient and sustainable transport. Like the 1998 white paper on transport policy by the UK government, *A New Deal for Transport, Scotland's Transport Future*

made a strong case for a healthy nation through reduction in car use and increases in active modes.

Glasgow Centre for Population Health (GCPH, 2010) in their review of transport policy in Scotland found that while the Scottish national, regional, and local strategy and policy highlight the importance of sustainable travel, central funding for infrastructure and support for active travel appeared to be sparse. The briefing paper by Transform Scotland (2009) also noted a lack of incentive for local authorities to develop robust targets towards road traffic stabilisation and the fact that the delivery of plans to reduce traffic volumes was not wholly within local authorities' control. This highlights issues similar to those from the previous decades with the inclination to favour provisions for the car skewing the opportunity set presented to individuals and undermining the aspiration for a more sustainable transport system.

Complementary to the sustainability agenda, the later 1980s and early 1990s onwards saw a development of a wide range of interventions aiming to influence the travel mode choices of individuals and organisations through awareness raising, marketing and education (Brög et al., 2009). These voluntary travel behaviour change initiatives or soft measures included IndiMark in Germany, Travel Blending in Australia and TravelWise and HeadStart in the UK. These measures are based on the recognition of the influence of subjective reasons (as well as policy and infrastructure changes) on choice of travel mode. The Scottish Government established the Smarter Choices Smarter Places (SCSP) programme in 2008 which covers a range of techniques that encourage people to modify their travel behaviour. This programme was publicised as helping to save people money, make them healthier, reduce transport emissions, and develop more cohesive communities (The Scottish Government, 2013). Similar to the other soft measures, it focusses on provision of information, marketing sustainable options and providing new services closely focussed on a particular target market. These soft measures have been successful. IndiMark, for example, showed a 13% increase in public transport use from 1996 to 2007. The SCSP initiatives in Scotland showed a change in travel behaviour, for example, walking to work increased in six out of the seven pilot areas between 2009 and 2012. In June 2014, Transport Scotland announced a £15 million funding package that will see a fleet of electric cars for car clubs and charging infrastructure investment to fund installation of up to 300 additional charging points; new cycling infrastructure and a roll out of the SCSP programme throughout Scotland over the next 2 years. This is a step in the right direction but Goodwin (2008)

cautions that on their own the SCSP programme is likely to have an invisibly small effect especially if alternatives to the car are less well developed and attractive to users.

2.6 Conclusion: A Shift from Optimum Choice to Consideration of Alternatives

The discussion above shows a general belief in the classical view of homo oeconomicus as an agent true to his preferences and perceived opportunities. However, transport policy differed between countries and changed focus with the passing of time due to two key factors: the assumptions made about the change in the transportation system required; and what was considered necessary to drive that change.

The difference in the focus of transport policy between the UK and the other European countries compared with it seems to have been due to the vision of the future each country had. UK policy makers seemed to have had a single vision of a car dominant future, while from the 1970s, policymakers in the Netherlands, Denmark and Germany tried to accommodate alternative modes as well. This led to a longer time span of the emphasis of a road building program over infrastructure for alternative modes in the UK compared to the other European countries.

The measures taken in all countries were geared at influencing the opportunity set of individuals - their situation - and therefore influence the choice of mode. From the 1970s, both the UK and other European countries seemed to recognise the need to support public transport as well as to regulate car traffic. However, there seemed to be more political will in the Netherlands, Denmark and Germany to follow through on this than in the UK. At the time, the UK government considered investment in more road infrastructure as a major driver in reviving the economy after the 1973 recession.

In addition to the two factors highlighted above, the discussion demonstrates the recognition in policy that individual preferences do differ and therefore alternatives to the car have to be considered and not just one optimum solution. This is more prominent from the 1990s onwards with the rise of the sustainability agenda. Voluntary behaviour change programmes such as SCSP demonstrated the recognition that influencing the decision making process would require a lot more than tinkering with the external situation or macro - environment in which the opportunities for individuals are found. It would require a consideration of the opportunity set more immediate to an individual - the micro - environment - such as the work or family situation; and the perception of the

social situation itself. The perception of the social situation points to the importance of social - psychological factors together with situational factors in travel decision making.

The next chapter will consider the immediate situational factors such as the changes individuals undergo along their life courses and social - psychological factors such as beliefs, motivations, habits and identities. These social - psychological factors may be considered to both arise from these situations and also influence behaviour in such a way as to create certain lifestyles or situations as well.

Chapter 3: Social - Psychological and Situational Influences in Travel Behaviour

3.1 Introduction

In this chapter, the immediate situational factors such as transport policy, location, infrastructure, household composition, and income, that might influence the knowledgeability of travel script and hence the travel decisions; as well as the social - psychological factors in particular beliefs, attitudes, habits and self - identity are discussed. The basic assumption of social - psychology is that the environment and the person interact to determine behaviour (Maio et al., 2007), therefore, the social - psychological factors which, in Chapter Two's conclusion, were said to both arise out of the situations and also create or reinforce some of the situational factors, are also considered.

The travel script was defined, in Chapter One, in two parts. The first part presented it as a mental representation of the individual's knowledgeability of the structures within which they are situated. The situational factors to be discussed can therefore be viewed as the set of rules and resources - generalizable procedures - that guide travel behaviour. These situational factors introduce into individuals' lives knowledge regarding, for example, time available for activities and travel, commute distances, financial and social resources. Through reflecting on and monitoring the situations faced, the individual comes to view the information as constraining or enabling a desired commute behaviour.

Sections 3.2 and 3.3 focus on situations that have been identified in transportation research as having a significant influence on travel behaviour; as well as the changing situations along an individual's life course. People make decisions throughout their life course, therefore, the travel script drawn upon to make travel decisions at each moment is different owing to changing situations. Mobility biography literature recognises this continuity of travel behaviour decisions over a lifetime. This literature proposes some key events along a life course, such as changes in residence, employment or career and family, which provide the opportunities for change of the situation.

The second part of the definition of the travel script noted that when activated, it organises the comprehension of the travel decisions and gives meaning to the action. This encompasses the social - psychological factors, such as attitudes and control

beliefs, which arise out of the evaluative response to the situations faced. Since this research is considering commuting behaviour that is repetitive, this also encompasses habits, which are defined as automatic responses to a specific situation in order to obtain certain goals (Verplanken et al., 1997). It is important to note that underlying these habits, are processes mediated by attitudes, control beliefs and other social - psychological factors. Habits express lifestyles that are distinctive patterns of behaviour, and over time people define their identities and express them in different actions and behaviours.

Section 3.4 therefore, focusses on the social - psychological factors that have been identified in the literature as influencing travel decisions; habits in travel behaviour; and identity as expressed in travel behaviour.

3.2 Situational Factors

The situational factors discussed in this section are the immediate external influences which an individual would experience. They are part of the set of knowledgeability factors or background information necessary for the formation of mental structures such as travel scripts. The factors discussed below help to illustrate some of the information that people glean from situations, assimilating and accommodating it into their travel scripts. The most researched situational factors identified from transportation research are:

1. **Transport or travel demand policy**: Eriksson et al. (2008a) and De Groot and Schuitema (2012) noted that implementation of policy is affected by the acceptability of the policy. The soft policy measures such as personalised travel planning or work place travel plans, for example, seemed to be accepted more by organisations and individuals. They have been found to have a significant impact on travel behaviour (Cairns et al., 2004). Gardner and Abraham (2007) noted the desire for autonomy as fundamental in the evaluation of policies, as people looked at how much it would impact on their convenience or cost. The fact that soft measures allow the individual to make their own choice about how much they might want to change their behaviour could therefore explain their relative success. Other policies such as limited parking at a work place may be viewed as a constraint to travel but one that can be budgeted for if one can afford to.

2. **Location:** Location changes are considered as medium term decisions that affect travel behaviour (Van Acker et al., 2010). There has been a lot of research investigating the link between the spatial environment and travel behaviour but by the 1990s, it became clear that simple spatial comparison of travel behaviour may lead to the wrong conclusions (Scheiner and Holz-Rau, 2007). Time and distance to various activities are directly affected by the spatial context, but they cannot be investigated in isolation from factors such as the available infrastructure, the composition of the household, or the resources available to the individual such as income or availability of a car.
3. **Infrastructure:** As discussed in Chapter Two, the provision of infrastructure for cars led to induced demand while poor provision of public transport and active travel infrastructure contributed to their low levels of use. Research by Beirao and Cabral (2007) identified some situational motivations affecting public transport use and they included: the quality of the service; the directness of the service; and the distance to public transport facilities like bus stops. Respondents in the Scottish Household Survey (2009) also note the lack of directness of route and lack of service as major factors deterring them from using public transport.
4. **Composition of Household:** Results from the Scottish Household Survey (2009) show a clear positive correlation between size of household and average trips per person per year. The mobility biography research - to be discussed in the following section - will also demonstrate the impact of children on household travel (Lanzendorf, 2010; Zwerts et al., 2007). Composition of the household is an important knowledgeability factor as it introduces various time constraints to travel especially with public transport and active travel. The composition of the household is also related to the complexity of the trip chaining because of the different needs of the members of the household. It could also have a big impact on residential location decisions.
5. **Affordability and Income:** Research such as Dargay (2007) and Scottish Government (2009) shows an increase in travel by car with increase in income. The Scottish Household Survey (2009) also shows that the position at work correlates with the use of the car with the highest position almost doubling the next highest in terms of distance travelled. When it comes to car use for the commute, being able to afford to run a car is definitely an enabling factor.

The factors discussed illustrate some of the constraints or enablers that are presented to individuals by those situations. These situations do not occur one at a time, but in combination with one another at different stages of an individual's life course. In investigating the possible construction of a travel script and how it might change when an individual is faced with different situations, it is important to consider its evolution along a life course. Transportation research borrows from sociology's life course perspective, and using the concept of mobility biographies investigates the influence of key events along a life course on travel behaviour.

3.3 Mobility Biography

The viewpoint of the life course approach is that people's behaviour can be explained by its continuity over a life time and by specific events that involve major changes in other domains of life (Lanzendorf, 2003). Mobility biographies focus on changes in travel behaviour over an individual's life course and can be defined as the development of travel demand over a person's life course (Scheiner, 2007). Scheiner further notes that changes in travel demand may be triggered by key events in the life course. Van de Waerden et al. (2003) define a key event as a major event in a person's life that will trigger a process of reconsidering current behaviour. These key events could be viewed as changes in one's situation whereby various aspects of travel demand may be affected such as the activity, the location, the household composition or the travel mode used. In other words, these key events, though denoting a change in situation along a life course, also encompass many of the situations discussed in Section 3.2 above at the time of their occurrence.

Mobility biographies are embedded in other biographies (Van Acker 2010). Van de Waerden (2003) identifies these as residential, household and employment biographies. As figure 3.1 shows, these partial biographies are interrelated with each other and with an individual's mobility biography. Lanzendorf (2003) alludes to these biographies when he situates the mobility biography within the lifestyle and accessibility domains of life. The lifestyle domain includes all those constraints and preferences for travelling that result from life choices in the broader range of a life course, such as, educational or professional careers, and household composition. The accessibility domain includes changes in spatial factors, such as, residential relocations or changes in the transport system.

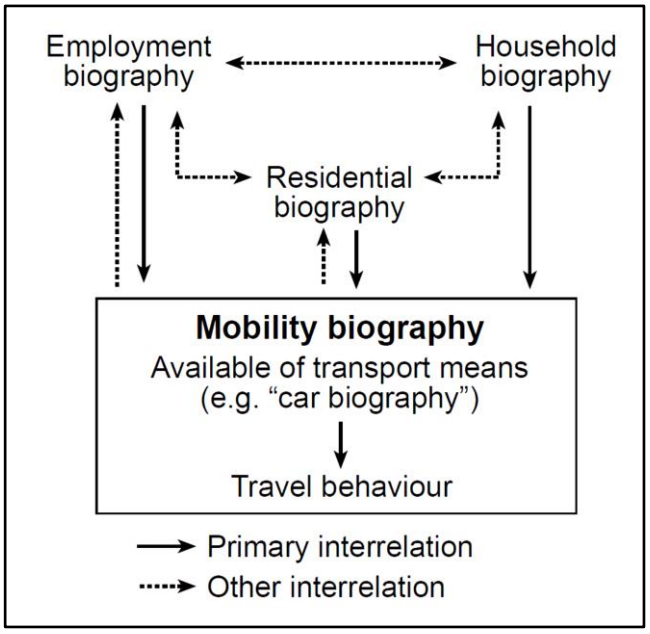


Figure 3.1: Interrelation of mobility biography with relevant partial biographies Source: Scheiner, 2007

3.3.1 The Household Biography

Events in this biography may include leaving the parental home, marriage, and the birth of a child. Household motorisation changes considerably with the increase or reduction of the number of adult household members (Scheiner, 2007). Research by Zwerts et al. (2007) looked at how the presence of children may affect the parent's travel behaviour and aimed to investigate not only the presence of children, but also the age of the children. They concluded that children do indeed affect parents' travel behaviour especially the number of trips and the trip length. The age of the child was important as children under 11 were noted to be extremely dependant on parents for transportation purposes. Many of the changes noted were also more pronounced for women than men. Heine and Mautz (cited in Lanzendorf, 2010) also note that while immediately before or after birth, car dependence is mainly determined by residential location, later on, constraints of coordination, time budget and other child centred narratives become responsible for the ever increasing car dependence.

3.3.2 Employment Biography

Within this partial biography, events such as the start of education, a new job, a promotion, and retirement are considered. Harms (2007), for example, in her research on the impact of leaving university and getting into working life concluded that travel behaviour in this life phase changes toward a more car dominated direction. During this

period, needs, opportunities and abilities may change in the short term until the time of the first well paid full time job.

Proximity to the work place seems to be less important as a location criterion. Scheiner (2007) attributes the loosening of the spatial ties between residential and work place locations to revolutions in accessibility over the last decade. He further notes that commute trip lengths are increasing as people tend to make a trade-off between maintaining anchored social ties and greater commute distances. For households with more than one person, consideration is often made of the other's employment biography.

Income changes are another key moment in the employment biography. Dargay (2001) finds lagged changes in motorisation following income changes. But usually as soon as the vehicle is there, it becomes indispensable. Scheiner (2007) concurs, noting that the car has some normative power concerning time - accessibility standards and self - determination of one's own time.

3.3.3 Residential Biography

This includes moving house and other changes in the spatial context. Residential moves correspond with events in the employment and household biographies, such as, change in the work place or the birth of a child. The consequences of a residential move for travel demand, Scheiner (2007) notes, lie in the changes in accessibility opportunities due to location change. There has been a lot of research investigating the link between the spatial environment and travel behaviour but by the 1990s, it became clear that simple spatial comparison of travel behaviour may lead to wrong conclusions (Scheiner and Holz-Rau, 2007). Later research demonstrated that the effects of attitudes and/or socio demographics on travel mode choice and car ownership dominate over the effects of urban form (Kitamura et al.; Handy et al. and Cao et al. cited in Scheiner and Holz-Rau, 2012). Some other studies have suggested that households select themselves into certain neighbourhood types according to car availability. Scheiner and Holz-Rau (2012) note that self - selection is not the sole explanation for the link between relocation and travel behaviour otherwise after relocation there would not be observed changes in the travel behaviour.

Scheiner and Holz-Rau (2013) caution that the mobility biography approach is individualistic in nature and so generation specifics and structural circumstances (such

as welfare changes or changing transport prices) relevant to travel behaviour, and policy implementation may be neglected. In a long term perspective, it is important to consider external conditions such as macro-economic, technological or political considerations relevant to the whole population; otherwise changes over time may be interpreted as biographically generated when in reality they are caused by external developments. Searching for cohort effects may also help detect historical changes. Frandberg and Vilhelmson (2011) for example, explore the mainstream trends in the development of spatial mobility in the Swedish population by looking at gendered mobilities and the new generation. They observed that generally men travel further and use cars more often than women even though women's travel patterns were more complex in term of the various activities. They also argue that the younger generation, having been confronted with spatial mobility as an ambivalent phenomenon, may be more open to break away from the dominant trends.

The literature discussed above offers a guide on what key events to look out for and probe from respondents' narratives, that is, changes in employment, household or family life and residential moves. It is expected that the progression from one of these changes to another can be traced along an individual's life course. This would then help to create a point in time where other situational changes such as changes in income or infrastructure or travel policy can also be explored, and compared with a later point in time. It would also be important to compare commuting history narratives from different cohorts in order to detect any historical changes that would have influenced travel behaviour.

3.4 Social - Psychological Factors and Travel Behaviour

This section considers the internal factors or states that are formed as individuals act within their environment and with other people. As suggested by the reflexivity of structure and agency in Structuration theory, these internal factors may in turn also influence how people act within their environment and with others.

3.4.1 Beliefs, Attitudes and Behaviour

Beliefs are abstract mental constructs about an object, issue, or person. When a person has a belief about something, s/he associates that thing with certain attributes. This discussion on beliefs is important as they are considered to influence or mediate the processes that underlie the formation of travel habits and the identities these habits

express. Beliefs have generally been accepted as the basis for attitudes, emotions and feelings; and therefore, would be expected to influence behaviour. Travel behaviour research based in social - psychology, for example, looks at the connection between attitudes towards locations, activities, modes, policies, etc and travel behaviour. This research has predominantly drawn from the expectancy - value model which posits that people's attitudes follow spontaneously and consistently from beliefs accessible in memory, and then guide behaviour. Beliefs are said to carry evaluative implications (Ajzen and Fishbein, 2000), therefore this attitude that guides behaviour can be a negative or positive evaluative response to the object, issue or person. In the exercise of agency, as proposed by Structuration theory, it is these beliefs and attitudes that would be reflexively monitored in order to change or reinforce the negative or positive evaluative response to an object, issue or person.

Theories based on the expectancy - value model and used in travel behaviour research include: Theory of Planned Behaviour (Ajzen and Fishbein, 2000; Ajzen, 2011, 1985); Value Belief Norm theory (Stern et al., 1999); and Theory of Interpersonal Behaviour (Triandis, 1977). They are causality theories that aim to explore what predisposes people to act in a particular way, in other words, what gives people the capability to act; to exercise their agency given a particular situation. The Theory of Planned Behaviour has been the most widely used. According to this theory, human behaviour is guided by: beliefs about the attributes of the behaviour or its likely consequences; beliefs about the normative expectations of other people; and beliefs about the presence of factors that may further or hinder the performance of the behaviour (Ajzen, 2002). The Value Belief Norm theory also proposes that beliefs about whom or what is affected by environmental conditions and the actions that could alleviate that threat link personal values to environmentally significant behaviour (Stern, 2000). The theory of Interpersonal Behaviour looks at all the aspects suggested by the previous two theories and adds to them the concepts of affect, habit, and situational constraints or conditions to predict behaviour. It has not been as widely used as the previous two theories.

While these theories propose particular variables such as attitudinal beliefs, perceived behavioural control beliefs and normative beliefs as predictors of behaviour, the investigation of these variables falls back on to the beliefs or attributes that are thought to be incorporated in these variables. These include feelings of relaxation, freedom, comfort, convenience, ease, pleasantness, guilt or personal obligation. For example, research investigating attitudinal beliefs towards various transport modes (Eriksson and

Forward, 2011; Chen and Chao, 2011; Bamberg et al., 2007; Bamberg et al., 2003; Bamberg and Schmidt, 2003) asks respondents to note on a Lickert scale their feelings of being relaxed, free, comfortable; or whether they consider their use of a particular travel mode as convenient or pleasant.

Control beliefs are measured by asking the respondent the extent they have the ability to perform the behaviour or the extent they think the behaviour is in their control. In the questionnaires, this is broken down into attributes such as: *To use (transport mode) on (certain trip) is very easy - very hard; my freedom to use (transport mode) for (certain trip) is very high - very low* (Eriksson and Forward, 2011; Chen and Chao, 2011; Bamberg et al, 2003).

The research on normative beliefs has been divided into investigation of personal norms and social norms. Personal norms have been assessed using questions about one's personal obligation to use a travel mode based on personal values, one's feelings of guilt when they use a car, or one's awareness of the consequences of their personal use of the car (Bamberg et al., 2007 and Eriksson et al., 2008a). Research looking at the predictive ability of social norms on travel behaviour focuses on the individual's perception of the expectations that valued others have about how they should behave. In Bamberg et al.'s (2007) study, the following statements are used: *People who are important for me think that in the next few weeks I should use public transport instead of the car for everyday routes here in X; people who are important for me would support my taking public transport instead of the car for everyday trips here in X.* Thorgersen (2006) uses the following phrases: *I believe that most of my acquaintances take the bus or train to work and shopping if the choice is between bus or train and their own car; I believe that most of my acquaintances expect that I take the bus or train to work and shopping if the choice is between bus or train and my own car.*

The current study does not seek to determine which of the social - psychological variables proposed by these theories has more predictive value for travel behaviour but seeks to demonstrate the influence of the beliefs and attributes underlying these variables (feelings and expectations of freedom, comfort, pleasantness, convenience, etc.) on the travel script. The fact that each of these variables has been shown by one study or another to predict an aspect of travel behaviour suggests this. Other studies that have not utilised the theories discussed above support this. Beirao and Cabral (2007), for example, asked their respondents to evaluate different modes by noting their

advantages and disadvantages. Attributes such as less stress, ability to relax, freedom and flexibility, uncertainty, convenience, comfort and lack of control are mentioned. Stradling et al. (2007) in investigating the perceptions towards bus use in Edinburgh also demonstrate the importance of the social - psychological beliefs and attributes that people hold in motivating or demotivation bus use.

Although the research discussed in this chapter so far, suggests that attitudes or other beliefs and attributes guide behaviour, they are unclear on how the individual comes to know their beliefs or attitudes. In contrast, Daryl Bem's Self - Perception theory (1965) suggests that the evaluation of the behaviour helps an individual to infer their attitudes or beliefs about it; in other words, behaviour may precede the beliefs or attitude about it through a self - perception process. Bem (1967) defines self - perception as an individual's ability to respond differently to their own behaviour and its controlling variables. His theory has two propositions: firstly, that individuals know their own attitudes, emotions or other internal states by inferring them from observation of their behaviour and the circumstances within which the behaviour occurs; secondly, that the individual may therefore be considered to be in the same position as an external observer, relying on external cues to infer inner states, to the extent that internal cues are weak or ambiguous (Bem, 1972).

With external sources of stimuli being accepted as reasonably exercising control over an individual's attributions of his attitude, self - perception processes were found to be central to the interpretation of the "foot in the door" phenomenon whereby people were likely to comply with a large request when it was preceded by a less demanding act of compliance (Fazio, 1987). The theory proposed that by complying with an initial small request, a person's attitude about being involved in that activity begin to change, and may become in his own eyes, the kind of person who does that sort of thing (Bem, 1972). This is an important phenomenon for the soft policy measures discussed in Chapter Two, as their aim is to enable individuals to voluntarily change travel behaviour towards more environmentally friendly modes. In addition, the "foot in the door" phenomenon illustrates the reflexivity of structure and agency. The consideration of the behaviour and the circumstances within which it occurs (structure and knowledgeability) to infer attitudes can be said to occur through reflexive monitoring and rationalisation. In this case, the positive evaluation of the behaviour gives the individual confidence in the action performed and further motivates the exercising of

agency in performing the behaviour again. The recurrent performance of this behaviour could then be noted as a manifestation of a particular mental structure.

Fazio (1987) in taking the self - perception concept further, considered three questions. Firstly, was non - performance as informative to the self - perception process as overt performance? He noted that while an overt refusal to perform a given behaviour can serve as an input to a self - perception process, frequently, it is the case that people do not refuse to behave but simply fail to take advantage of an opportunity to behave in a particular war. For example, a person with a direct cycle path from their home to the work place may still simply commute daily by car. While this should be as informative about one's attitude as overt behaviour, experiments by Fazio, Sherman and Herr (1982) suggest that non - behaviours are less likely to be used as a basis for judgement. People tend to have a blind spot when it comes to non - behaviour.

The second question considered what the status of beliefs or attitudes was prior to and following self - perception. Fazio agreed with Bem (1967; 1972) that self - perception processes are limited to cases where individuals lack a strong initial attitude. Therefore if the belief or attitude is not easily accessible from memory, the individual may infer it from recently performed behaviour. However, attitudes inferred from behaviour displayed remarkable strength as people recognise that their freely chosen behaviour - where there are no external constraints - are a highly reliable and relevant indication of their attitudes and beliefs about a behaviour and its controlling variables.

The third question looked at what might motivate an individual to form beliefs, internal states or attitudes via a self - perception process. He noted that people engage in self - perception when faced with a verbal inquiry about their attitude. In the context of travel behaviour, a respondent being interviewed about their behaviour, for example, will likely reflect on it and infer some of the beliefs and attitudes he communicates. On the other hand, earlier research by Fazio, Lenn and Effrein (1984) showed that individuals can form attitudes naturally or spontaneously when it is functional for them to do so. For example, when an individual expects future questioning about the attitude object/ issue/ person or expects future interaction with the object, he is likely to form a belief or attitude about it immediately rather than later.

In the current study, which deals with commuting as repetitive behaviour, it is expected that attitudes about different commute behaviours begin to form early on since the individual expects to perform the behaviour again; and also that part of this attitude

formation is in part via a self - perception process as the changing situations in their life course will require a response to the change in the controlling variables of the behaviour. In addition, the reliance of the current study on retrospective interviews means that at least some of the beliefs respondents communicate about their commuting history are arrived at after evaluation of the behaviour during the interview.

Whether beliefs or attitudes precede or follow behaviour is not pertinent to this research. Respondents who, for example, say that they commuted by car because they needed the flexibility that public transport could not give them seem to have their commute choice driven by the belief that the car is more flexible. Respondents who, on the other hand, note that they have never given much thought to why they commute by car, adding that it is convenient seem to be inferring the belief of the convenience of the car from their daily use of it. In each case, whether one is aware of their belief or not, there is a connection between the belief and the behaviour. Fazio (1987) in fact cautions that it is not possible to determine whether attitudes are inferred from behaviour only, or whether both attitudes and behaviour were commonly dependent upon various features of the stimuli. Beliefs and consequently attitude formation can occur via a self - perception process or some other process or multiple processes of which observation of behaviour is one.

That there is any connection at all between beliefs, attitudes and behaviour, as demonstrated by the expectancy - value related research or the self - perception related studies discussed above is enough to support the postulate of this current study: that social - psychological beliefs or attitudes, even though not always conspicuous, together with the knowledgeability about an individual's situation form the mental construct or travel script drawn upon to make commuting decisions.

Due to the implicit nature of these internal states, beliefs or attitudes, it is necessary to consider the patterns of behaviour whose underlying processes draw on these beliefs. The focus of the following discussion will be on the significance of habits and identities to travel behaviour.

3.4.2 Habits and Travel Behaviour

The preceding discussion proposes habits as patterns of behaviour that draw on the internal states, beliefs or attitudes presented. It is also important to consider habits when studying daily travel behaviour such as commuting. In travel behaviour, there are two

main ways of looking at habits: as repetitive automatically triggered behaviour; or as a tendency and way of being that connects people's behaviours to their identities.

The first, proposed by studies such as Aarts and Dijksterhuis (2000), Orbell and Verplanken, (2010), and Verplanken et al. (1997) views habit as automatically triggered behaviour acquired through repetition and positive reinforcement. Four inter-related aspects about travel habits, gleaned from these studies and others, are especially important for this research because they are consistent with concepts related to mental scripts and mental effort in travel decision making.

1. **That travel habits are goal directed**

   Verplanken et al. (1997) define habits as learned sequences of acts that become automatic responses to specific situations which may be functional in obtaining certain goals. They further state that this goal directedness of habits distinguishes them from other automatic behaviours such as reflexes. Eriksson et al. (2008b) also conceptualise habits as the automatic link between a goal and a specified behaviour. Aarts and Dijksterhuis (2000) posit that the goal to travel calls for the use of a certain type of transport mode to achieve that goal. Therefore, it is plausible to assume travel mode choices habitual when we have used them to achieve the same goal repeatedly in the past. This goal directedness of travel habits is important for the current study's concept of the travel script since the activation of this script was noted as giving meaning to a particular action. In other words, the activation of a script is particular to a specific situation and action. This suggests that the activation of a travel script is goal directed as well.

   Verplanken et al. (1997) propose two mediators of the choice of travel mode once a travel goal is activated: the situation's characteristics such as distance, time and weather conditions, which call for particular solutions; and the particular solutions or choice options themselves, which also have particular characteristics fitting or not fitting the situation's demands. All this information can be acquired externally (such as proposed by self - perception theory) or retrieved from memory. Aarts and Dijksterhuis (2000) also agree that habits are mentally represented. This presents another relation to the travel script. Firstly, in so far as both are proposed to be mental representations; and secondly, the

information proposed to be drawn from memory to help in decision making could be argued to be part of the knowledgeability of a travel script.

2. **That establishment of habits requires increased frequency of the behaviour**

   Defining habits as repetitive behaviour implies the presence of similar past behaviour and an increased frequency in performing the behaviour. Fujii and Garling (2003) concluded from their study that the increase in the frequency of using a travel mode causes the developing of a habit or a script of using that mode. In Chapter One, it was proposed that through reflexive monitoring of behaviour, people maintain a continued understanding of the grounds for the activity. Therefore, with each repetition of particular travel behaviour, an attitude or belief about this behaviour forms. This might make certain knowledgeability factors more salient at subsequent episodes, making it easier to quickly make the same decision again and again. This enables the forming of a habit of the behaviour. Garling et al. (2001) seem to be in agreement with this stance, noting that past experience helps to develop simplifying heuristics that would side-step the extensive information processing that would be required to make a choice from all the possibly known or perceived alternatives.

3. **That habits are enabled by the presence of particular cues**

   The discussion on the first aspect about habits hints on this by proposing that situation characteristics as well as choice option characteristics that fit that situation mediate the travel goal and the behaviour chosen. Ajzen (2002), insisting that behaviour is always under cognitive and motivational factors, proposes that habits illustrate that behaviour is temporarily stable as long as the stimulus situation remains stable. The stimulus situation comprises the cognitive and motivational factors, of which he proposes that control beliefs' stability is most crucial for the stability of behaviour. This particular aspect - the necessity of the presence of situation cues for the stability of habits - has led to the proposal of habit breaking strategies based on changes of these cues such as temporary changes to infrastructure and price solutions. The emphasis of situation cues can also be argued to complement the mobility biography literature that proposes that the timing of the habit breaking intervention is crucial and more effective when introduced at the occurrence of a life event.

4. **That habits help to alleviate the cognitive load or mental effort involved in decision making**

   In Chapter One, it was noted that engaging the travel script to guide travel behaviour decisions required a judgement of mental effort, usually towards, minimising effort. Walker et al. (2015) propose that behaviours are initially products of a (bounded) rational decision process. Repeatedly choosing the behaviour in a stable context, makes it unnecessary to go through a consideration of accessible beliefs, therefore attitudes and beliefs can be retrieved without much cognitive effort (Bamberg et al., 2003). The behaviour is almost reflexively initiated by environmental cues rather than deliberate decision processes - an adaptive strategy, Walker et al. (2015) suggest, for minimising cognitive effort. Garling et al. (2001) are in agreement, suggesting that it would not be necessary to search all the attribute information of a choice alternative if the same choice can be arrived at with a subset of the information. Therefore, the attribute information can be thought of as stored in the memory as a script which is retrieved when a subset of the information is available. This ties in with the aspects of habits being cued by particular situations; as well as being goal directed. It is important to remember that the goal to travel encompasses other goals related to time, cost, convenience, comfort and other attributes. The mode chosen is perceived to satisfy all these sub-goals, therefore, the script based choice in which the mode is chosen is also expected to satisfy these goals, without having to undertake extensive information processing.

All these four aspects are assumed when measuring travel habits. Some travel behaviour studies such as Chen and Chao (2011), Bamberg et al. (2003) and Murtagh et al. (2012) use self - reported frequency of past behaviour as a measure of habit. Verplanken et al. (1997) developed a "script" based method which relies on mental representations of activities that may involve habitual acts. Other studies such as Bamberg and Schmidt (2003) and Fujii and Gärling (2003) adopted this method. Respondents are presented with a number of trips and asked to as quickly as possible mention the first mode of transport that comes to mind as one they would use. The frequency of choices for a particular mode across a number of trips serves as a measure of habit strength for choosing that mode; hence, this method is also called the "response frequency measure of habit." This method seems to be presenting respondents with situational cues that trigger a mental script that allows the respondent to choose a mode quickly.

The second way of considering habits in travel behaviour research is as a tendency or a disposition and fundamental way of being that connects people's behaviour to their identities. This is proposed by Schwanen et al., (2012). They borrow the idea from French philosopher, Felix Ravaisson, that habits are a stable way of being that develops through the continuity of change. An individual's tendency to undergo change coming from an external factor will decrease with each repetition and at the same time, their ability to initiate change will increase with each repetition such that the change is initiated with increasing ease and effort. In commuting, for example, an individual may initially become frustrated with the congestion faced on the way to work, triggering thoughts of how the situation could be changed. Over time, however, they may get used to the congestion and even use the time stuck in traffic for other things such as relaxing with their favourite music after work.

Also, borrowing from American philosopher and psychologist, John Dewey, they further propose that habit is a predisposition, ability, or an art formed through past experiences. Therefore, habit is an active force where by outcome can be considered as open ended rather than pre-given or automatic. Habits emerge from our interaction with other persons and our environment and are not just individual centred. Schwanen et al. (2012) explain this using the example of a car habit, which is said to make it possible for the car, the driver, the road, road signs, passengers and traffic rules to merge into a seemingly effortless whole that underpins the routine use of cars to access places. Habits are therefore, here, understood as generative or enabling tendencies, the changing of which would require time, patience and persistence. There are many different elements woven together in a habit, therefore, change should not be based on changes to one or some condition, as the situation cue centric strategies suggest.

This second way of viewing habits also complements the travel script concept. The concept of the continuity of change supports the idea that the script would develop and be adjusted over time owing to changing situations that an individual would - with time - more easily assimilate into their mental structure. The concept of the merging of various aspects gleaned from other persons and the environment, into a whole that underpins behaviour, complements the concept of self - identity, which in Chapter One was said to be a dynamic product of the interaction of capacities for memory with physical and societal structures. From habits, this view proposes, people can glimpse tendencies or expressions of identities.

3.4.3 Self - identity, Lifestyles and Travel Behaviour

Having looked at habits as an expression of identity, this section considers the concept of identities, in particular: the relationship between the self - identity and travel script concepts; and how identities have been used in travel behaviour literature. Identities are said to guide actions chosen or resisted. Self - identity, in particular, is how an individual might describe oneself. It is influenced by personal motivations as well as social interaction in the form of demands and expectations of others (Whitmarsh and O'Neill, 2010). It can encompass physical attributes, preferences, values, personal goals, habitual behaviour, personal traits and personal narratives (Gatersleben et al., 2014). This conceptualisation of self - identity is line with Identity Process Theory's postulate that identity structure consists of social - psychological factors such as the beliefs and attitudes discussed in Section 3.4.1. It also complements Schwanen et al.'s (2012) view of habits as a fundamental way of being that connects behaviour and identities, and emerging from individuals' interaction with other people and their environment.

The self - identity concept is important for the travel script, more so, in as far as the engagement of a travel script organises the comprehension of a travel decision and gives meaning to the action taken. In assigning meaning to an action, people can be said to make sense of it in relation to self. It is suggested by the Identity Process theory, for example, that the ways in which new components are absorbed (into a mental structure such as a travel script) is through the assimilation and accommodation processes which seek to be in line with certain "personal" principles such as self - efficacy.

Whitmarsh and O'Neill (2010) propose two levels at which identity may operate in the context of pro - environmental behaviour: behaviour specific and generic. The majority of travel behaviour studies dealing with identity seem to have utilised the behaviour specific view of identity. This view considers a particular pro - environmental behaviour such as "green traveller" and looks at explaining persistence in the performance of that behaviour; and what the patterns of the behaviour express about the individual's social position or sense of self. Earlier studies did not use the term "identity" but looked at life styles. Giddens (1991), for example, proposes lifestyles as a concept that offers a package of practices that are associated with a particular trajectory, and further suggests that the lines between personal identity and lifestyles are blurred.

The earlier travel behaviour literature borrowed the concept from marketing studies which looked at lifestyles as a composite of motivations, needs and wants that reflect people's self - image or self - concept; the way they see themselves and believe they are seen by others (Van Acker et al., 2014). Driessen and Goosen (1993) defined lifestyles as distinctive patterns of behaviour by which people elucidate who they are and to which social group they belong or want to belong. This conceptualisation of lifestyles is clearly complementary to the self - identity concept, and a number of travel behaviour studies (Collantes and Mokhtarian, 2007; Anable, 2005; Bagley and Mokhtarian, 2002; Lanzendorf, 2002; Jensen, 1999) collected data on attitudes and preferences; emphasising the attitudinal and/ or behavioural differences between individuals which could be used to distinguish between different groups of travellers (Barr and Prillwitz, 2012). Through this segmentation, these studies developed different lifestyle types or mobility styles.

Barr and Prillwitz (2012) argue that the focus of travel behaviour studies at this time on segmentation and mobility styles, was partly due to the late 1980s shift in public policy to a greater reliance on individuals as vehicles for social change. The segmentation approach was based on the assumption that individual consumers share within particular groups, broad characteristics, attitudes and behaviours. Lifestyle types or mobility styles were, therefore, used to examine the motivations and barriers for the adoption of more sustainable transport modes by different "identity" groups. Anabel (2005) suggests that the value of this segmentation approach was in its ability to be translated into achievable strategies. This study, where she identified three car and three alternative modes segments, illustrates that even though behaviour can be similar among a group of people, their attitudes or motivations differ. For example, whereas both the car addicts and malcontented motorists segments identified by her study drove frequently, their reasons for doing so differed. The malcontented motorists seemed to face or perceive low control over travelling by alternative modes such as the bus and therefore chose to use the car. The car addicts, on the other hand, seemed to lack an awareness of any need to change their behaviour. Jensen (1999) urges caution on the way this segmentation research is translated into strategies. He notes the naivety of creating transport systems simply based on the various segments highlighted by different studies, but proposes that these segments can be used in the planning process to recognise the diversity and differences in needs and perceptions. He surmises that the differences brought out by

the segmentation highlight that a single strategy is not enough, and different agencies and people would have to work together to coordinate efforts.

The second level at which identities may operate is the generic level which encompasses a sub-set of all possible environmental actions. Kitamura (2009) proposes a similar generic view of lifestyles as a values and behavioural orientation which is more stable and changes in the long term through changes in values, attitudes and preferences. At this level, identity could be considered as a latent factor that motivates behavioural patterns; and is suggested as affecting a wider range of behaviours across contexts and situations (Gatersleben et al., 2014). Giddens (1991) notes that a person's self - concept and commitment to lifestyle practices is more or less stable subject to different conditions. Lifestyles are, therefore, not static packages but follow reflexive processes and form part of the structure from which one draws information that shapes their identity.

Van Acker et al. (2014) elaborate on what the contexts and situations may encompass when they refer to lifestyles - as an individual's orientations towards issues such as family, work, leisure and consumption which in turn structure behaviour patterns. Salomon et al. (1983) also defined lifestyles in travel behaviour as the pattern of behaviour which conforms to the individual's orientation towards the three major roles - as a household member, a worker, and a consumer of leisure; and to the constrained resources available. This complements the mobility biography studies which situate a mobility biography within a wider residential, employment or household biography; and propose these wider domains as presenting the constraints and opportunities that affect travel decisions along a life course.

Viewing identities as dynamic, stable and changeable in the long term and affecting behaviour across contexts and situations underlies two important issues for the current research. Firstly, that people operate in different social contexts and therefore draw on multiple identities in travel script construction and engagement. Murtagh et al. (2012b) found evidence that multiple identities are related to travel behaviour on regular journeys. The identities were related to the travel behaviour such as *driver* or *cyclist;* or social identities such as *parent* or *spouse*. These identities were found to vary in importance and salience.

Secondly, and related to the previous issue, identities develop with time. The change of time across a life course will inevitably bring with it a change in situations or context.

All the while, information would be continuously assimilated and accommodated in a travel script. The engagement of a travel script into a particular travel action is itself, together with the assimilated and accommodated information reflexively evaluated in the different situations and contexts in order that whatever action is chosen, it is in line with one's self - concept.

3.5 Conclusion

This chapter presents an overview of the situational and social - psychological factors drawn upon in the construction and engagement of the travel script. The situational factors identified included transportation policy, location, infrastructure, household composition and income. These were shown to influence the decision making process by presenting various constraints and enablers to individuals. They were noted as occurring in various combinations with each other and to change as an individual's life course progressed. It was suggested that different key events such as changes in the family, job or residence along the life course would present the opportunities for change either of these situational factors or an individual's perception of them. The current research proposes that these factors make up the knowledgeability of the travel script and as they change, are constantly assimilated and accommodated into this mental structure.

From the literature review, it is also clear that individuals' perceptions of the situational factors is influenced by social - psychological factors, particularly, certain beliefs and attitudes people hold about their social and physical environment and the travel modes available. Attributes such as feelings and expectations of freedom, comfort, convenience and guilt or personal obligation were said to underlie the attitudinal, normative and control beliefs. It was also noted that while studies show that these beliefs or attitudes and the attributes underlying them guide behaviour, the individual may also come to know these beliefs and attitudes by evaluating their behaviour. Therefore, it is expected that some of the attitudes gathered during data collection may become apparent to the respondent at the time of the interview as they reflect on their travel choices and behaviour. This is not to be taken as unreliable information as attitudes inferred from behaviour have been shown to have remarkable strength as people recognise their freely chosen behaviour.

Habits were proposed as mentally represented patterns of behaviour that draw on these beliefs and attitudes. When a habit exists, it can be assumed that the same general travel

script would be engaged for a particular repetitive journey such as commuting. Habits were noted to be goal directed; therefore it can be argued that the travel script that is engaged repetitively satisfies particular goals for an individual. Because habits are repetitive, it is expected that repeatedly choosing to engage the same travel script would be done with decreasing mental effort. Initially, however, there would be a more involved judgement of mental effort exercise.

Habits were noted as expression of self - identity. Identity was proposed as an even broader and latent factor that would influence the knowledgeability drawn upon in the construction of the travel script and the internal states that might influence its engagement. As the travel script is engaged across an individual's life course, there is reflexive evaluation of the situational and social - psychological factors discussed. This could reinforce the continued engagement of the travel script thus strengthening a habit, or it could lead to a change or adjustment of the script engaged. All this is suggested to be done in line with an individual's self - identity.

In summary, the literature review points out certain issues that the researcher would need to look out for during the data collection and analysis, in order to answer the research objectives for example:

- Key events along respondent's life courses such as changes in their residence, employment status or family
- The situational factors such as location, infrastructure, income and household that are noted especially in connection with the key events
- Turning points in individual commuting behaviour and the factors that surrounded that time in their life course
- Any differences in mental effort during travel decision making at these turning points, and whether this can be used to segment the commuters, in order to evaluate differences in their underlying motivations and beliefs
- What travel goals seem to be aspired to; and since it was noted that perception of the situation (distance, time, weather) as well as attributes of the choice itself mediate the travel choice and the goal activated, what are these perceptions and how do they relate to the goals?

Chapter 4: Methodology

4.1 Introduction

This chapter presents the methodology used to collect and analyse the commuting history narratives of 82 respondents working at the Heriot-Watt University campus and Research Park in Riccarton, Edinburgh. Below is a summary of the methodological issues that are discussed and justified in this chapter.

Firstly, a review of different methodologies used in travel behaviour research is presented. A brief overview of quantitative methodologies aligned with a positivist epistemology and qualitative methodologies aligned with an interpretivist epistemology is presented. Qualitative methodologies are noted as better able to understand issues from the respondents' own point of view – which the current research intends to achieve. The narrative approach is singled out among the qualitative methodologies as best suited to investigate life histories such as the commuting histories on which the current study is focussed.

Next, an overview of the narrative approach is discussed including: how to collect data using the narrative approach; how to analyse this data; and the limitations of using the narrative approach. The rest of the chapter describes in detail:

- How data was actually collected. This discussion includes the rationale for the sample selection.
- The steps taken in analysing the data using Schutze's approach. In brief, the approach involved: indexical mining of data from which groups such as the key events, commuting mode groups, and cohorts were identified and used to classify the narratives; and non - indexical data mining from which:
    - Generalised script diagrams or representations at key events along life courses were developed
    - Commute goals and coping strategies as well as the attributes underlying them were extracted and identified as motivating commute decisions, and aligned with certain self - identities

4.2 Review of Methodologies from Travel Behaviour Research

4.2.1 Quantitative Methodologies

Travel behaviour research uses both quantitative and qualitative techniques. Research that uses quantitative methods usually takes a positivist approach; is preoccupied with discrete observable and quantifiable elements; and strives for generalizable conclusions (Bryman, 2012). Data collection methods driven by this epistemological approach therefore use large samples and data is collected in a restrictive manner. In transportation research, for example, some studies have asked respondents to keep a log of specific activities within a specified period (Gärling et al., 1998), others use experimental techniques (Aarts and Dijksterhuis, 2000; Darker et al., 2010) while many other studies use multiple choice questionnaires. Positivist and quantitative research lends itself to statistical analysis (Walliman, 2006) such as the structural equation modelling used by Bamberg et. al., (2003) and Chen and Chao (2011). Explanations from quantitative research are aimed at demonstrating causality (Bryman, 2012). Hunecke et al.'s (2007) study, for example, compared the predictive power of psychological, socio-demographic and infrastructural variables in the use of private motorised modes. They aimed to identify significant correlation between psychological variables and the use of private motorised modes, over and above socio demographic and infrastructural factors. They concede to the limitation that their study only utilised variables that describe a current state of mental representations without explaining the dynamics when mental representations are changing.

Positivist research investigating constructs that are generally accepted as being constructed over time, such as identity, is cognisant of the influence the current state of mental representations of their respondents can have on the validity of their data and try to mitigate it. For example, Murtagh et al. (2012a) in their study on the relationship between self - identity threat and resistance to change travel behaviour, ensured the target identity was salient to the participant from the start of the questionnaire. With self - identity generally accepted as heavily influenced by an individual's social world, they strived to control their respondents' personal circumstances rather than seek to capture the complexity of travel mode choices. Firstly respondents with similar socio-demographic characteristics were selected. Secondly, by using vignettes, the researchers were able to present the respondents with similar and discrete social contexts in which to form their opinions or make their decisions. Nevertheless, such an approach

quarantines the identities from the social environment in which they are produced, thus, the complexity of the factors that influence a travel decision is not captured.

While questionnaires allow for respondents' replies to be easily aggregated, the researcher's main issues rather than the respondents' perceived main issues remain the focus of the research. The replies are all in response to cues from the schedule developed by the researcher. For the present study, it is important that the influencing factors expressed are not initially cued by the researcher. This is because factors which may otherwise not be salient to the respondent may be brought to the fore, thus interfering in some way with the way information is drawn from the mental structure. There is therefore a need to use methodologies rooted in an interpretivist epistemology, which is also likely to capture the complexity of the factors affecting travel decisions.

4.2.2 Qualitative Methodologies

Most qualitative research in travel behaviour assumes an interpretivist epistemology and aims to understand the concept from the respondents' point of view. Ritchie and Lewis (2003) note that qualitative research is an interpretive approach concerned with understanding the meanings which people attach to actions, decisions, beliefs and values within their social worlds. They further note that the research design based on this approach needs to be flexible and mindful of the participants' frames of reference. The data collection methods associated with the interpretivist qualitative approach include in-depth interviews, observational methods, group discussions, narratives and analysis of documentary evidence. Because of the unstructured nature of the data derived from qualitative methods, they are not straightforward to analyse (Bryman, 2012). The methods of analysis used, such as, analytic induction, grounded theory or narrative analysis reflect the complexity, detail and context of the data (Ritchie and Lewis, 2003).

The current study seeks to investigate how the interactions of the various internal and external factors that influence travel behaviour contribute to the construction, adjustment and engagement of a travel script along a life course. From the literature review, the researcher is aware of the variety of factors that make up the knowledgeability of the script - what one knows that constrains or enables travel - as well as the internal states, beliefs, attitudes that underlie the habits and perceived self - identity that motivates travel behaviour. In order for a respondent's own mental structure to be gleaned from the responses, it is important that they be allowed to speak

freely and spontaneously. This would allow the issues that are more pertinent to the respondent to be expressed initially, as opposed to issues arising as a result of a response to a cue from the researcher. The respondent will also need to speak about their travel history from the time they were children till the present in order to investigate the development of the script along a life course. The narrative methodology would be best suited to collect and analyse this spontaneously expressed travel history.

4.3 The Narrative Method

Narrative inquiry studies stories or descriptions of a series of events (Clandinin, 2007). Researchers using the narrative method believe it's a good way to see different and sometimes contradictory layers of meaning; to bring them into useful dialogue with each other; and understand more about the individual and social change (Andrews et al., 2013). Giovannoli (2000) notes that the purpose of narrative research is to study personal experience and meaning making in a systematic manner. The narrative approach supports a fully psycho-societal understanding where both sociological and psychological dynamics are understood as situated historically (Wengraf, 2013). It allows the researcher to be mindful of the temporal order of events and also to contextualise the human experience. Contextualism is sensitive to the particulars of time and space, and considers characters in relation to other characters and to the unfolding "plot" of the experience. It allows us to account for the multiplicity of events that together form an interconnected totality.

4.3.1 Using Open Narratives to Collect Data

Wengraf (2013) proposes that the narrative is a specific way of giving an account oriented towards a story. Bauer (1996) notes that story telling follows a self - generating schema with three main characteristics:

i. Detailed texture which gives a detailed account for transition from one event to another, accounting for time, place, motives, points of orientation, plans, strategies and abilities
ii. Relevance fixation in which the story teller focusses on features of selective events which are relative according to his perspective of the world
iii. Closing of the Gestalt: Every story is expected to come to a conclusion

To elicit a narrative from an interviewee, Bauer (1996) proposes that the interviewer should familiarise themselves with the field and have some extrinsic issues or themes:

those which reflect the interest of the researcher and are formulated in the researcher's own "language". He contrasts these extrinsic issues with intrinsic themes that arise during the narrative. Most open narrative researchers propose 3 main stages to elicit narratives:

i. **Present the initial central topic in general terms:** Bauer (1996), for example, proposes the use of visual aids such as timelines or diagrams to present the initial topic while Wengraf (2013) uses what he abbreviates as SQUIN - a single question aimed at inducing a narrative.

ii. **Main Narration:** Bauer (1996) and Wengraf (2013) agree that the main narration should be uninterrupted in order to allow the interviewee to present their general view on what for them has remained the same or changed and some sense of how they currently understand that change. Wengraf (2013) calls this sub session 1 and suggests that the interviewer should actively listen while taking down cue phrases to help with the next stage. Cue phrases could be things that come out strongly as being important to the interviewee or they could be based on a firm set of pre-existing theoretical issues. The main narration stage is similar to that described by Lieblich et al. (cited in Giovannoli, 2000) whereby the person's narrative is viewed as a book with several chapters and the first step would be to think about the chapters and transition points that mark the transition from one chapter to another.

iii. **Questioning phase or Sub session 2:** This stage follows the natural conclusion of the main narrative. Lieblich et al. (cited in Giovannoli, 2000) posit that with the chapters identified, further probing of significant episodes can be done into the influences and reasons given for particular episodes. This provides an opportunity to explore further respondents' attitudes and ways of seeing the world (Wengraf 2013).

4.3.2 Narrative Analysis Approaches

Narrative analysis refers to a family of approaches to diverse kinds of text which have in common a storied form (Riessman, 2005). They could be structuralist or thematic, among other approaches. Jovchelovitch and Bauer (2000) also discuss Schutze's (1983;1977) six step approach for analysing narratives. Riessman (2005) notes that the structuralist approach to narrative analysis emphasises the way a story is told, analysing the function of the clause in the overall narrative. It is similar to the form perspective

identified by Lieblich (cited in Giovannoli, 2000) which focusses on the structure, grammar, style or sequence of the narrative, uncovering formal elements such as events, protagonists, situations, beginnings and endings arranged in a sequence that is comparable across narratives.

Thematic analysis on the other hand emphasises the content of the text rather than how the story is told. With thematic analysis, the text is systematically reduced, for example by summarising paragraphs into sentences (Bauer, 1996). From this, a coding system could be developed based on common thematic elements identified across research participants and the events they report. It is similar to the categorical content approach proposed by Lieblich (cited in Giovannoli (2000)) which analyses stories for criteria that would place them in already identified categories, and views the language as a resource rather than a topic of investigation.

Schutze's approach for analysing narratives proposes first, a detailed transcription of the verbal material. Second, the text would be separated into indexical and non - indexical material. The indexical material would include who did "what, when, where and why" while the non - indexical material refers to expressions of values and judgements. Thirdly, the indexical components would then be used to analyse the ordering of the events for the individuals to come up with trajectories. The fourth step involves analysing the non - indexical material. In the fifth step, individual trajectories are compared leading to the sixth step which is the putting of these individual trajectories into context and establishing similarities in order to recognise collective trajectories.

The analysis approach employed by this research incorporated both Schutze's proposal and the categorical content or thematic analysis.

4.3.3 Limitations of the Narrative Method

No method of data collection in social science research is perfect. It is important to be aware of some of the limitations of the particular method chosen as this may affect the quality of data collected and subsequent analysis. For the narrative method, the interviewer should through the pilot interviews identify the most suitable way to present the initial central question in general terms, without needing to continuously clarify. The way an interviewer initiates the interview co-determines the quality of the narration and this reliance of the interview process on the quality of the introduction would also pose standardisation problems if there were multiple interviewers. This will not be a problem

for this research as there is only one interviewer. However, the interviewer may experience considerable stress in trying to standardise the initiation phase for each interview (Bauer, 1996), especially if they are not experienced in this method already.

Any narrator will make hypotheses about what the interviewer wants to hear and what she probably knows and therefore will tend not to talk about some issues or take others for granted. The interviewer should be aware of this strategic communication and that some respondents may be defensive or try to portray themselves in a positive light (Jovchelovitch and Bauer, 2000).

While the narrative method is proposed as revealing the relevance structures of the respondent, there is a bit of scepticism surrounding this, with critics claiming that the conversation is guided by expectations of expectations (Bauer, 1996). Realistically, the interviewer should not rule out strategic narration and by being aware of its possibility, the interviewer can ensure that during the questioning phase, implicit issues are elaborated and clarified.

For this research in particular, the use of retrospective interviews creates a reliance on the narrator's memory. The respondent will be monitoring and rationalising behaviour and events at different times in their past. This reflexive monitoring and rationalisation will be occurring at the time of the interview and therefore, it may not directly mirror the reflexive monitoring and rationalisation of behaviour and events at key events in the past. This would be because of the change in the knowledgeability that is certain to have occurred over time. The only way to mitigate this, given the time constraints, is to bring together the narratives of people in the same category and use them as the narrative of a hypothetical person or persona belonging to that category.

4.4 Data Collection

This section presents the rationale for the decisions surrounding the sample selected for data collection and details how the narrative approach was used to collect commuting history narratives of 82 respondents in Edinburgh. Firstly, the reasons for choosing the commute as the journey to study are presented followed by the reasons behind the three sample selection criteria: age of the respondents; age of the children; and access to two or more commuting modes. The interviewing process through which the commuting history narratives are elicited is then described.

4.4.1 Why Commuting?

This research set out to investigate how a travel script might be constructed and develop over time. It was necessary that the script be repeatedly engaged for long periods of time such that a generalised script could be inferred. Commuting to work as repetitive travel behaviour offered this opportunity. The commute journey is a journey that enables access to an individual's means for livelihood and is therefore undertaken by most adults. Compared to trips for shopping, or visiting friends, the commute to work is made on an almost daily basis allowing for the formation of habits and the establishing of generalizable mental representations. Furthermore, among Scottish residents, commuting accounted for the highest number of trips with 25% of the journeys made for commuting purposes in 2008 (Scottish Government, 2009). About 69% of the commute trips are made by private car; with people aged between 30 and 59 years travelling almost double the distance travelled by 16 to 29 year olds (Scottish Household Survey, 2007/08).

4.4.2 Sample Selection

Unlike sampling for a quantitative study, sample selection in qualitative research need not strive for randomness. Interpretation and a deeper understanding, rather than generalisation, is the aim of qualitative research, therefore, the sample which would be productive in answering the research questions is selected. Marshal (1996) notes that there are three main sampling strategies for qualitative research: convenience sampling whereby the most accessible subjects are selected; judgemental or purposive sampling where the researcher actively selects the most productive sample to answer the research questions; and theoretical sampling which necessitates building interpretative theories from the emerging data and selecting a new sample to examine and elaborate on this theory. This research will utilise a combination of convenience and purposive sampling.

In selecting a sample that would be most productive for the research, Marshal (1996) proposes developing a framework of variables that might influence an individual's contribution and selecting the sample based on these variables. Once the criteria is clear, the researcher utilising purposive sampling samples to ensure a good deal of variety in the resulting sample so that members differ from each other in terms of the key characteristics (Bryman, 2012). For this research, while the unit of analysis is the individual, Heriot-Watt University and Research Park have been selected partly because it is accessible to the researcher and the location provides a point of commonality

among the respondents. The National Travel Survey data was used to further develop a framework of variables to narrow down the sample. The following criteria further guided the sample selection:

1. Respondents aged 30 and above
2. Respondents with children 5 years and above to allow the sample to include people who had experienced or were about to experience the school run.
3. Respondents with access to more than one mode of transport for commuting; this would allow the interrogation of factors that are related to the choice of both the private car and other modes.

The preceding discussion puts forward a case for the first two criteria.

4.4.3 Age of Respondents

The foremost thought in selecting respondents was for people who possibly had an established commuting habit. The research therefore sought the group of adults that commuted the most. Using data from the National Travel Survey, Scottish results 2011/2012[1], the differences in commuting between 16-29 year olds and 30-59 year olds are highlighted. Comparing commuting to work only (not to education), 30-59 year olds made 326 commute trips in that year, compared to the 244 trips made by 16-29 year olds. The average distance and time for the commute by different modes, for both groups was also compared. The commute trip as a proportion of all trips made by the two groups in a year was used to calculate the proportion of distance travelled or number of trips for walking, car or bus, for commute only. For example:

Table 30 of the 2011/2012 National Travel Survey (see Appendix A) showed the "Trips per person per year - by purpose, age and gender". From this table, we could calculate the proportion of all trips that are for commuting. For 16-29 year olds, this was:

244/931= 0.26

This proportion is applied to Tables 28 (trips per person per year by main mode) and 29 (distance travelled per person per year) (see Appendix A) to obtain the number of commute trips for different modes and the average distance. For example, from table 29, average distance for walking per year by 16-29 year olds is 200 miles. The proportion of miles for commuting then would be 0.26*200= 52 miles. The same method is used to

[1] The data for tables 28,29 and 30 combines five survey years, 2008-2012 to achieve a larger sample.

calculate the proportion of number of trips per year. Average distance for each mode is calculated by dividing distance by number of trips per year.

Table 4.1: Proportion of Commuting Distance and Trips per Year

	Proportion of Average distance travelled per year for commuting (miles)		**Proportion of Number of trips per year for commuting**		**Average commute distance (miles)**	
	16-29	30-59	16-29	30-59	16-29	30-59
Walk	52	43.21	68.9	61.53	0.75	0.70
Car (Driver)	686.4	1706.36	77.74	189.08	8.83	9.02
Other (cycling, motor bike, private bus)	38.22	62.06	4.94	5.51	7.74	11.26
local bus	196.82	96.28	31.46	17.4	6.25	5.53

The average commute distance by walking or driving was roughly the same between the two groups. 30-59 year olds travelled a smaller distance by their local bus and a larger distance by other private modes compared to 16-29 year olds. Comparing the number of trips for each mode made by the different groups provides a clearer picture of the differences. 30-59 year olds made over twice the number of commute trips by car as a driver compared to 16-29 year olds. 16-29 year olds made almost double the number of commuting trips by local bus as 30-59 year olds.

It could be assumed that the high number of commute trips by car by 30-59 year olds compared to 16-29 year olds is not only due to the fact that they are probably earning more money and can afford the car, but also, could be due to the time in their life course. Between 16-29 years, an individual undergoes a number of key events following each other such as leaving home, starting further education, finishing further education, starting work etc. Lanzendorf (2010) posits that in mobility biographies, the occurrence of many key events reduces as age increases. He singles outs Franke's (cited in Lanzendorf, 2010) suggestion that for most people, travel habits are relatively firmly established at about the age of 35 possibly due to a decrease in the key events experienced in other domains of life. It can therefore be assumed that travel habits start to become more established when one is in their 30s. The decision to start at 30 rather

than 35 was simply to cover all bases, in the event that for some respondents, this plateauing of key events in the other biographies that affect the mobility biography occurred earlier. Table 4.2 shows the age distribution of participants achieved by the current research.

Table 4.2: Age Distribution of the Respondents in Current Study

Age range	Below 30	30-39	40-49	50-59	60-69
Number of respondents	1[2]	18	20	32	11

4.4.4 That Respondents should have Children

Lanzendorf (2010) considers what key events affect the travel behaviour of young parents and how changes in the travel behaviour are related to the key events. The focus on young parents is based on the assumption that parents of small children would be in a life period when they had just passed or were still encountering major changes in various trajectories of their lives. Some of these major changes may include: a change in residence, which may be associated with a change in location specific characteristics that could affect travel behaviour; living with a partner; the start of a professional career and earning money; completion of an education career; or the purchase of a family car.

Having carried out interviews with 20 young parents in Leipzig, Germany, the majority of whom were women, Lanzendorf (2010) notes that women still take on the burden of childcare even though traditional household roles may have changed and men increasingly share maintenance tasks with their wives. The impact of childbirth is less obvious for men. They usually continued with their jobs while most mothers did not continue with their careers after the birth of the first child but stayed home or worked part time. Having children requires the parents to reorganise their daily activity scheduling. Some of the mothers interviewed in Lanzendorf's study believed that the private car is the best solution for the changing activities and travel needs. This argument came particularly from mothers who previously cycled, used public transport or a combination of the two. While the majority of women before the birth of a child owned a car, few used it frequently. After the birth of the first child, there was a slight

[2] This respondent had a 10 year old child and had therefore undergone a number of the events that most other respondents experienced in their later 20s or early 30s

increase in private car and intermodal use compared to use of bicycles and public transport.

Zwerts et al. (2007) carried out a large travel behaviour study in Belgium looking at how the arrival of a child affects the parent's travel behaviour. They considered the differences in trip making, the number of trips and the distance travelled. One of the more pertinent issues to emerge from this research is that the age of the child has an impact on the parent's travel behaviour. From about 6 years when the child starts primary school, the parents need to travel more: couples with children under 14 make on average more trips than other couples; when the youngest is about 8 or 9 the trip purpose of picking up and dropping off accounts for more than a quarter of all trips compared to couples without children; until the age of 11, children are extremely dependent on parents especially mothers for transportation purposes. This was the basis of focussing on parents with children 5 years and above as this is the general age for the start of primary school in Britain. Table 4.3 summarises the spread of the respondents regarding the age of the children.

Table 4.3: Distribution of the Age of the Last Child of the Respondents in Current Study

Child age	No children	Nursery/ Primary	Secondary	Above 16
Number of respondents	25	18	10	29

There were 4 respondents whose children were below 5 years but were interviewed, three of them had children who were 3 or 4 years old but had already identified the primary schools they would be attending. They were therefore considered to have thought about how their commute might or might not change due to the school run. They were also able to provide experiences of the commute in relation to travel to nursery. The fourth respondent had recently become a father by the time of the interview.

4.4.5 Pilot Interviews

Having narrowed down the data collection method to the narrative approach, 6 pilot interviews were carried out. They were in the form of a retrospective interview, allowing the respondent to go as far back as they could remember and provide a

narrative of their commuting to education, later to work and from then up to the present. The main purpose of the pilot interviews was:

- To test out options for presenting the initial question
- As a crucial learning tool for the researcher in being able to identify cue phrases or parts of the narrative that would drive the questioning part of the interview to solicit particular incident narratives.
- To test out concepts such as the extent of the influence of having children in the household on the commute.

From the pilot interviews, the usefulness of having the respondent start their narrative from at least primary school became apparent. Even though the narrative for commuting to primary and secondary school was relatively short, for some, it elicited memories of how travel was like back then allowing them to highlight some of the social issues at the time. More importantly, most respondents became more comfortable as they progressed with their narrative, therefore starting further back than the start of further education or work provided a "warm up" to a better narrative of commuting during their adult life.

Probing key events that were mentioned in the narrative proved to be useful in soliciting particular incident narratives. The probing centred on changes to the commute mode mentioned or key events in other biographies mentioned such as having children or starting the first job. The respondents were also encouraged to speak at length about their current commute and their reasons for not using the alternative modes that were available to them.

The pilots reinforced the resolve to probe any changes to commuting due to starting a family or simply arising during the period when the respondent had children in the household. It was also decided that a small sample of people without children should be interviewed to allow comparison of the issues arising.

4.4.6 Main Fieldwork

Incorporating what has already been discussed regarding the research criteria and the lessons from the pilots, the main fieldwork commenced and 79 interviews were carried out with employees of Heriot-Watt University and Research Park. The interviews started with the general introduction below:

> "Thank you for meeting with me. What I'm trying to do is to find out how somebody's social environment or things they've experienced throughout their

life might influence how they view their commute, their attitudes of different modes… I'll be asking you to go as far back as your childhood, think about how you commuted to school, and sort of work your way up through primary school, secondary school, college or uni, first job, subsequent jobs to the present and any residential changes that might have occurred in between that changed your commute. And then after your narrative I'd go back to find out why you think things happened the way they did or your reasons for doing things the way you did. So whenever you are ready…"

There is no rule of thumb as to the number of qualitative interviews that would be considered enough. Bryman (2012) for example suggests between 20 and 30 interviews while other researchers propose no less than 60 (Gerson and Horowitz cited in Bryman, 2012). This research aimed to achieve saturation, a point at which no new information can be gleaned from the data collected. Three of the pilot interviews were added to the 79, bringing the total of narratives to be analysed to 82. The interviews lasted on average 30 minutes.

All the respondents had previously participated in a travel survey run by Transition Heriot-Watt and noted their interest in taking part in an interview with a PhD student. Respondents were first contacted via e-mail (see Appendix B). The study was briefly introduced to them and the criteria for selecting respondents stated. Those who fit the criteria were requested to respond to the email if they were still interested. A response rate of 42% was achieved.

The interviews were conducted in accordance with the ethical guidelines and principles of the university. The research received ethical approval from the school's ethics committee. A consent form (Appendix C) was sent out to all participants highlighting their voluntary participation, confidentiality and anonymity. All interviewees agreed to have the interview digitally recorded and for excerpts to be used for the present study as long as all steps to guard their anonymity were taken. During the fieldwork period, the researcher closely monitored the person attributes of the respondents such as age, whether they were parents, current default mode and distance from work to ensure that a good cross section of respondents were interviewed.

After the 32nd interview, a criterion regarding distance was added. This was because for respondents who lived 13 or more miles away, while they had access to some public transport, it was for all cases too cumbersome and so they used the car. Subsequent emails that were sent out asked for respondents who lived not more than 13 miles away

from the university campus. After about the 65th interview, it seemed that no new information was being put forward by the respondents especially those with children. The sample however was short on younger respondents, and those who did not have children. The selection of respondents from that point emphasised respondents with these attributes. Interviews were carried out with respondents that were outside of these attributes during this time as well, but only because the appointments had already been confirmed. Table 4.4 below shows a general breakdown of the spread of the sample.

Table 4.4: Summary of Number of Narratives Collected for the Current Study

Female	Male	With children	No children	Below 50	Above 50	Car as current default mode	Alternative modes as current default
58	24	57	25	39	43	47	35
82		**82**		**82**		**82**	

At the end of each interview, there was some time taken to debrief. In this time, the main person characteristics of the respondents were noted together with the main issues that arose from the interview or which the interviewee seemed to emphasise. This process was not only helpful in starting to identify themes, but was also helpful in judging when saturation was being reached.

4.5 Data Analysis

This study used Schutze's narrative analysis approach. This approach separates the data into indexical and non - indexical data. Thematic analysis was used to analyse the non-indexical data since the content rather that how the story is told was the subject of investigation.

Schutze's approach was found to be most suitable for data analysis because it looks at establishing collective trajectories from individual trajectories. This is important for this research because of the large number of respondents being dealt with. The main aim of this research is to explore the construction and engagement of a travel script, more so, the generalised or hypothetical script. This was noted in Chapter One as evolving following a lot of experience by an individual and could be generalised across contexts; it is a "meta-script" to guide behaviour in a range of related situations. Most qualitative research undertakes in-depth analysis of data from a small sample of respondents. The

relatively large sample used in this study offered a better opportunity to consider the experiences of different individuals as part of the experience of a "hypothetical" individual within a particular general trajectory. The travel scripts of individuals in the 1970s cohort, currently commuting by car, for example, could be considered as categorical scripts that could be collated into a richer "meta-script" for the hypothetical individual.

The thematic analysis of the non-indexical data would then provide a more in-depth understanding of the perception, and therefore, assimilation and accommodation of the knowledgeability factors into a generalised travel script; as well as the meanings, commute goals, evaluation of mental effort and coping strategies that would influence and enable the engagement of the generalised travel script.

4.5.1 Indexical Data Mining and Analysis

All interviews were transcribed verbatim by the researcher. The transcripts were then put through a process of "quantitative mining" similar to that described by Schutze (cited in Jovchelovitch and Bauer, 2000). Discrete attributes about the respondents and their experiences were mined from the transcripts, for example: their current age; the age and year when different key events occurred, such as, starting a regular car commute or having their first child (see Appendix D). With relation to the age and years at which events occurred, some of this information was expressly mentioned by the interviewee. Most other information could be extrapolated, within a year of its occurrence, from the years mentioned for other events. For a few respondents, only the best approximation was used, for example the general age at which one might have started university. This process was used as a basis for mapping out collective trajectories and exploring how knowledgeability factors constrained or enabled commuting at the different key events along these trajectories. The collective trajectories were based on two criteria: the current default commute mode and the cohort.

Life Cycle Key Events

From the indexical data, numerous events were identified along the life courses of all the respondents. The key events chosen for further investigation were those that could easily be pinpointed to a particular point in time for the majority of respondents. Respondents, for example, spoke about the various changes in

jobs and residences they went through. While it was easy to pinpoint when the current or first job started, it was more difficult to gauge when the changes in between occurred. This was because some respondents spoke about them sequentially, one by one; others lumped some of the changes together; and others mixed up the order of the changes.

The events are broadly categorised in two groups: mode related events and life cycle events as table 4.5 shows. Mode related events relate to switches between modes specifically from or to the car as a regular mode for commuting. Along a person's life course, the mode related events occur in a particular order; one cannot start a regular car commute unless they acquire a driving licence and one cannot break from a regular car commute unless they had started it.

Table 4.5: Key events investigated

Mode related events	Life cycle events
Acquired driving licence (DL)	Start of further education (FE)
Started regular car commute (SC)	Start of first job (FJ)
Broke from regular car commute (Break)	Starting a family/ Having the first child (FC)
Resumed regular car commute	Moving to current residence (MH)
(S. Break).	Moving to their current job (MJ).

The life cycle events are events in other domains of our lives such as the family, employment and residential biographies discussed in Chapter Three. The order that they take is particular to an individual's life course. It is the life cycle events that are particularly used as a criterion to group the data. In exploring the construction of the script, the life cycle events are not only part of the knowledgeability of the script, but also, for analysis purposes, are used to bound the situation. Only the situational factors that are expressed in relation to a particular life cycle event are considered as part of the travel script for that event.

Some of these life cycle events such as the *start of the first job* and *starting a family*, have an evolving character. This means that once they occur, their influence on travel behaviour can evolve over time as other events associated with them also affect travel behaviour. For example, when one starts their first job, they begin a process of career development which with time may mean more financial means which can affect the choice of modes available to travel; the birth of a child also brings with it different constraints as the child develops from an infant to a teenager.

Earlier life cycle events such as the start of primary and secondary school could be easily pinpointed from the transcripts, together with the modes used at these times. However, the decisions relating to travel to primary or secondary school are usually not personal decisions but made for them to some extent by their parents. It is for this reason that the analysis focussed on the life cycle events starting from *further education*. At this stage, many young adults are starting to be responsible for their own decisions and many leave their homes.

Current Default Commute Mode

The transcripts were grouped according to the current default commuting mode of the respondents. The default commuting mode was that which was used for the majority of days in a week for commuting to work. The reason for this categorisation was the assumption that a travel script would evolve through time to resemble the current one which would be drawn upon to enable commuting with the current default mode. In other words, the collective commuting trajectories would terminate at the present time into a commute mainly by car or by alternative modes.

The default commuting mode is that which is used most days in a week to travel to work. It is assumed to be that mode whose choice has become script based or habitual due to repetition. The respondents were divided into those who currently commuted by car (car - default) and those who currently commuted by alternative modes such as the bus, bicycle or walked (alt - default). This study has 47 car - default respondents and 35 alt - default respondents. The average length of the commute for car - default respondents is 9.3 miles which is comparable to information from the National Travel Survey. The average commute distance for alt - default respondents in 9.0 miles, a variation from

National Travel Survey data, which when walking, cycling and public transport is combined averages 5.83 miles. When the three exceptionally long alternative modes commutes of 63, 27 and 19 miles are excluded, the average commuting distance drops to a more comparable 6.5 miles.

The Cohorts

The indexical data provided the age and years in which different key events were experienced. To tease out any cohort effects on the changes in commute mode, scatter plots of the age at which different mode related events occurred and the current age of the respondents were drawn up. The data in general suggests that the age at which one acquires a drivers licence is positively correlated - albeit only modestly - with one's current age (Figure 4.1: R= 0.310). This suggests that older respondents acquired a driving licence later than younger respondents.

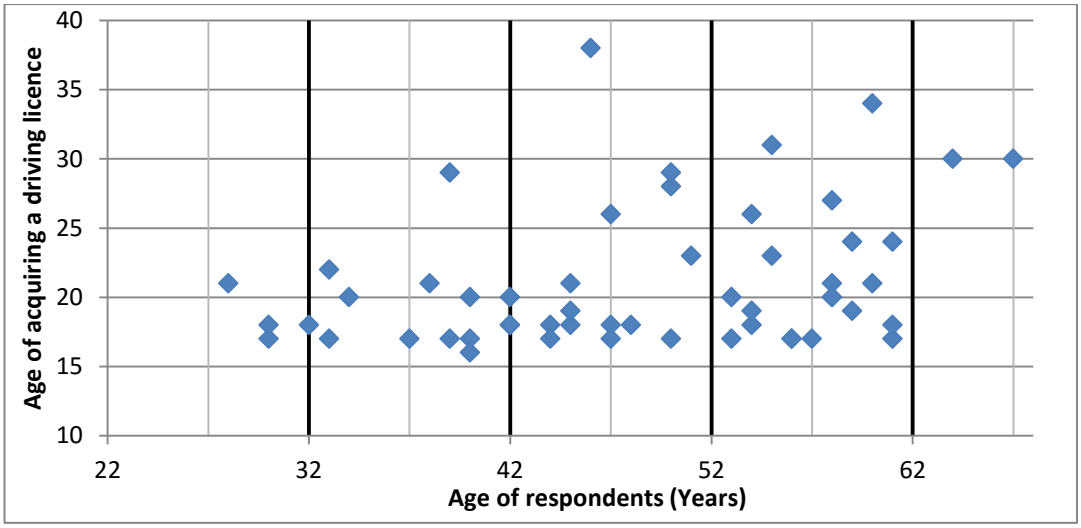


Figure 4.1: Scatter plot for age of acquiring driving licence against the age of the respondent

Having considered the changes in transportation policy in the UK in different decades in Chapter Two, the researcher explored splitting the respondents further based on these decades, as shown by the bold vertical grid lines. The visual effect supported the correlation suggesting that more respondents above 42 years acquired a driving licence later than respondents below 42 years. A person attribute connecting different people in each decade had to be identified as a basis for the cohort. As with the key events, this attribute was based on when the respondents were likely to be solely responsible for their commuting

decisions. In the UK, the age at which one can acquire a driver's licence is 17 years. The data was, therefore, split according to whether the respondent was or turned 17 in the different decades. There were very few respondents who turned 17 in the 1960s or 2000s as figures 5.1 and 5.2 show. They were considered with their closest decade, therefore only the 1970s, 1980s and the 1990s were considered. The bold vertical gridlines in figures 5.1 and 5.2 demarcate the cohorts. The 1970s cohort refers to people who were or turned 17 between 1970 and 1979. These are respondents who were 52 years and above in 2014. The 1980s and 1990s cohorts are similarly defined with their ages in 2014 being 42 - 51; and 41 and below respectively.

Having defined the cohorts, the age at which the mode related events occurred was examined to quickly flush out any cohort specific changes in commute mode. Looking at the 1970s cohort, 81% had acquired a driving licence by the end of the following decade while 83% of the 1980s cohort had obtained a driving licence by the end of the following decade, and 94% of the 1990s cohort had obtained a driving licence by the end of the following decade. The difference is more noticeable between the 1970s and 1990s cohorts.

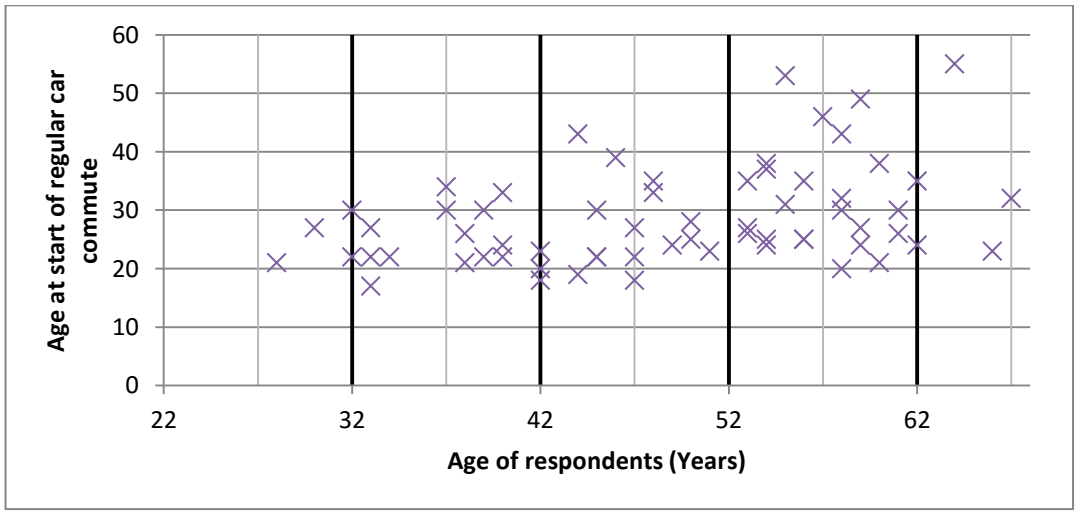


Figure 4.2: Scatter plot for age at which regular car use was started against age of the respondent

Acquiring a driving licence does not necessarily imply one will start driving regularly. Figure 4.2 shows a positive correlation between the age at which one starts regular car use and the current age of the respondent (R=0.397). With each succeeding decade, less people started regular car use after the age of 30. Comparing the decades, there seems to be some differences in the trends with

respondents who were or turned 17 within the 1970s slower to start using the car. For all decades, a smaller proportion of respondents started regular use of the car in the same decade they attained the legal driving age. This is not surprising considering most respondents acquired a driving licence between 17 and 22, and have on average 5 years between acquiring a driving licence and start of regular car use. This combined with the fact that one may turn 17 towards the end of the decade explains why the following decade has a larger proportion of respondents starting regular use of the car. Therefore, combining the percentages for start of regular car use of the decade in which one turns 17 and the following decade, we see that respondents who turned 17 in the 1970s were indeed slower to adopt the car. Only 53% of them were driving regularly by the end of the 1980s, compared to 75% of the respondents who turned 17 in the 1980s, driving regularly by the end of the 1990s, and 64% of those who turned 17 in the 1990s by 2014.

The means and medians of different cohorts, for the period between acquisition of a driving licence and start of regular car use, further support this (Table 4.6). The higher mean and median for the 1970s cohort compared with the 1980s and 1990s suggests that not only does the 1970s cohort acquire a driving licence and start car use later than other cohorts; they delayed the start of the regular car commute more than the other cohorts.

Table 4.6: Mean and median of the period between acquiring a licence and start of regular car commute

Cohort	Mean	Median
1990	4.67	3
1980	5	1
1970	9.6	8

Looking at when respondents took a break from regular car driving (Figure 4.3), there is a positive correlation between the age at which one took this break and the current age of the respondent (R= 0.671). This suggests that older respondents broke from a regular car commute at a later age than younger

respondents. Comparing the proportions for different cohorts, more of the older respondents took a break from the car. Of those who turned 17 during the 1970s and started regular car use, 50% of them took a break from the car with 63% of the 50% sustaining this break to the present.

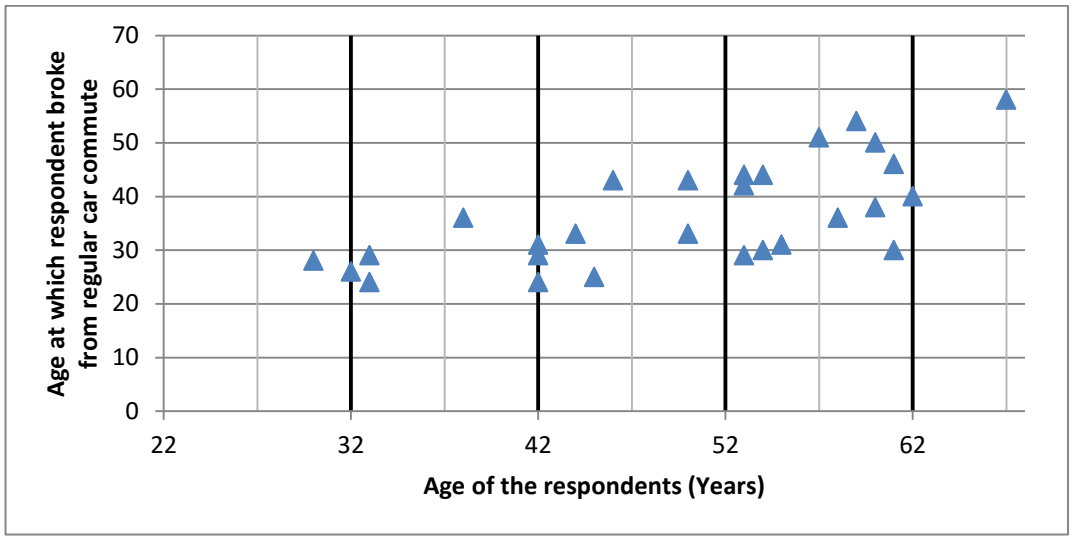


Figure 4.3: Age at which respondent broke from the car against the current age of the respondent

Figure 4.3 shows that over half of the respondents who had a break from regular car use are from the 1970s cohort. Earlier graphs show that more respondents from the 1970s cohort than other cohorts started regular car use after the age of 30. So it is possible that even though more respondents broke from the 1970s cohort than other cohorts, they had regular use of the car for the same or a much longer period before the break than other cohorts.

Figure 4.4 reveals 5 respondents in the 1970s cohort who had driven for 16 to 30 years before they decided to break from the car. The other respondents in the 1970s cohort averaged 4.4 years before the break. The 1980s cohort had 3 respondents who had driven for 10 to 18 years before the break with the rest in that cohort averaging 4.6 years before the break. The 1990s cohort had one respondent who had driven for 10 years with the rest averaging 2.25 years before the break.

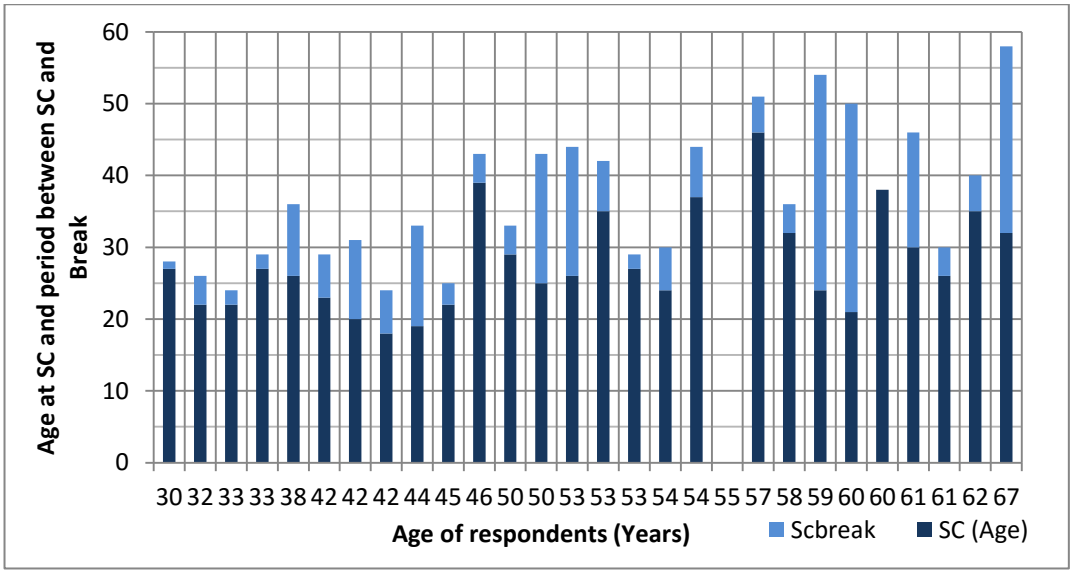


Figure 4.4: Comparing age at which regular car use started with the length of time leading up to the break from the car

The graph was filtered for the different cohorts to determine if there was any relationship between the ages at which one starts to drive and the length of the driving before the break. For all cohorts there was no discernible relationship. The questions therefore remain: what factors or situations influenced the break from regular car use? What influenced some respondents to sustain their break from a regular car use and others to resume the regular car use? How come other people did not break from regular car use and others did not even start regular car use?

The rationale for cohorts was based on a simple statistical analysis of the current age of the respondents and the changes in commute mode along a life course. Some changes between the cohorts were suggested for example: respondents in the 1970s cohort were seen to acquire a driving licence later than the rest; delay the start of regular car use compared to the 1980s and 1990s cohorts; and also more from the 1970s cohort sustained their break from a regular car commute to the present compared to the 1980s and 1990s cohorts. While the strength of correlation for these analyses was low, other information such as proportions from different cohorts suggest that the cohort definition - the decade when one was or turned 17 - together with the current default commuting mode provide a reasonable basis for the collective trajectories. These are: 1970s, 1980s, 1990s car - default life courses; and 1970s, 1980s, 1990a alt - default life courses.

4.5.2 Non- Indexical Data Analysis

This data was analysed by thematic analysis using NVivo. The transcripts were coded firstly into nodes (categories) that denoted the life cycle key events identified, such as, the *start of further education* and *starting a family*, and an additional node for the present time called "justifications". Paragraphs or statements that related to a particular life cycle key event were placed into the corresponding event category; and those that related to the present time were coded under "justifications". The NVivo nodes for each life cycle event and *justifications* were then coded into other nodes to identify the situational factors mentioned at each event. The situational factors were coded either as constraints or enablers. For each constraint and enabler identified, there was a further sub-code denoting whether it was a financial, social or infrastructure related constraint or enabler. By running several matrix coding queries in NVivo, the tables in Appendix E were drawn up to help identify the constraints and enablers specific to each key event. These were based on Sewell's postulate that structures exist in the things we know and the way we put them into practice. The tables also noted which mode of commuting the constraints or enablers were related to. From these tables, general representations of a travel script at a particular key event were developed such as shown in figure 4.5.

Understanding the Generalised Script Diagrams

The generalised script diagrams are representations of the mental structures that aggregate the vast information in the tables in Appendix E, noting only the most frequently expressed constraints and enablers. In this representation, the situational factors that would enable or constrain an individual's travel choice, leading to different choices from the alternatives are obvious in the script model. They are represented as the red vertical text boxes for the constraints and the horizontal green text boxes for the enablers. The grey horizontal lines represent the likelihood of using one mode in relation to another for commuting to work at a particular period along the life course.

The sample travel script in figure 4.5 below, for example, shows that the majority of respondents mentioned proximity constraints as a factor that influenced the shifts: from "active" modes to the car or public transport (PT); and from public transport to the car, as denoted by the grey arrows before the constraint. The next most expressed constraint in this sample script would be the "Public transport system constraints" which are mentioned as influencing the

shift from public transport to the car, as denoted by the arrow before the constraint.

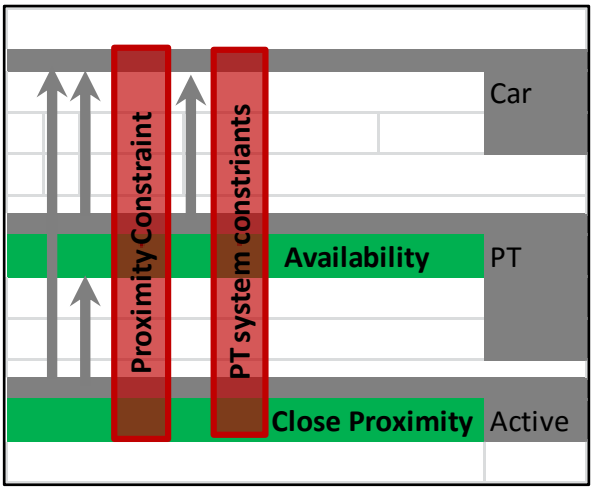


Figure 4. 5: Sample travel script representation

The sample script above also shows that for the respondents who used active modes, they mentioned close proximity as an enabling factor while availability of public transport was mentioned as its enabler. Some modes will not have a horizontal green box below to denote their enabler. This simply means that while the respondents mentioned using that mode, they did not expressly state what enabled its use.

The likelihood to use one mode or another at a particular time along the life course was based on the proportion of respondents that used the mode to commute during the period of the particular key event. The thickness at the end of the grey lines representing the modes denoted this likelihood. The thickness for one mode only takes on meaning if compared with other modes in the script. For example, the thickness of "car" is of no significance unless viewed in light of the thickness of "PT" or "Active" in which case, we see in this sample travel script that it was more likely for one to use "PT" or "car" than "active" modes.

The myriad of social - psychological factors like the beliefs, attitudes, habit and perception of mental effort are assumed implicit in the likelihood of using the different modes, and considered as mostly influencing the engagement of the travel script. This is based on the fact that different groups of respondents, faced with similar situational factors at the same key event, chose to commute by different modes as Chapter Five will show. If the commute behaviour is seen as satisfying certain goals, then the varying

perceptions of the different modes as capable of satisfying the commute goals are arguably responsible for the difference in mode choice.

The perceptions of commuting expressed at different key events were also coded in NVivo to extract some of the underlying judgements of mental effort. Attributes such as complacency, enjoyment, freedom, convenience - which were said to underlie the beliefs and attitudes - together with mastery experiences, time perceptions, and coping mechanisms were identified from the transcripts as related to the principle of self - efficacy, coping strategies and other mental processes akin to filtering or trading off one aspect against another in order to engage a travel script in line with one's self - identity. The thematic analysis to extract the perceptions and judgements of mental effort at each key event yielded sparse material. The material extracted from the *justifications* node however was in abundance and enabled the teasing out of the mental processes supporting and reinforcing the current script for the different trajectories. This information was also tabulated as in Appendix F grouping the nodes into the broad categories of self - efficacy and other trade-offs or thresholds, to extract the goals and coping strategies as described below.

Extraction of Goals and Coping Strategies from the Narrative

Texts from the life cycle events and *justifications* categories were further coded to extract themes related to perceptions of mental effort or general perceptions of the commute. These included complacency, enjoyment, mastery experiences, mode adequacy perceptions, time perceptions, coping mechanisms, etc. as figure 4.6 shows.

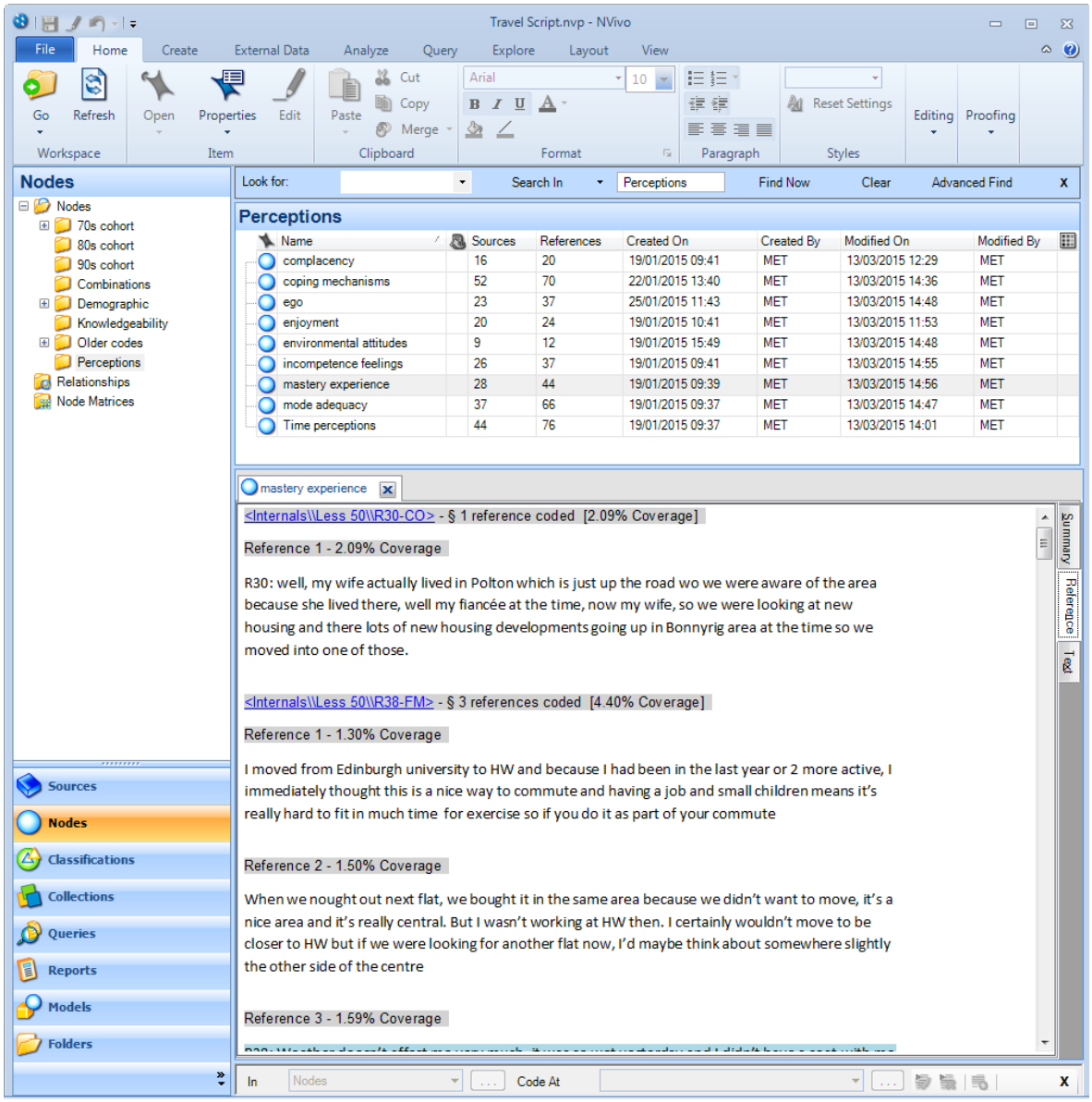
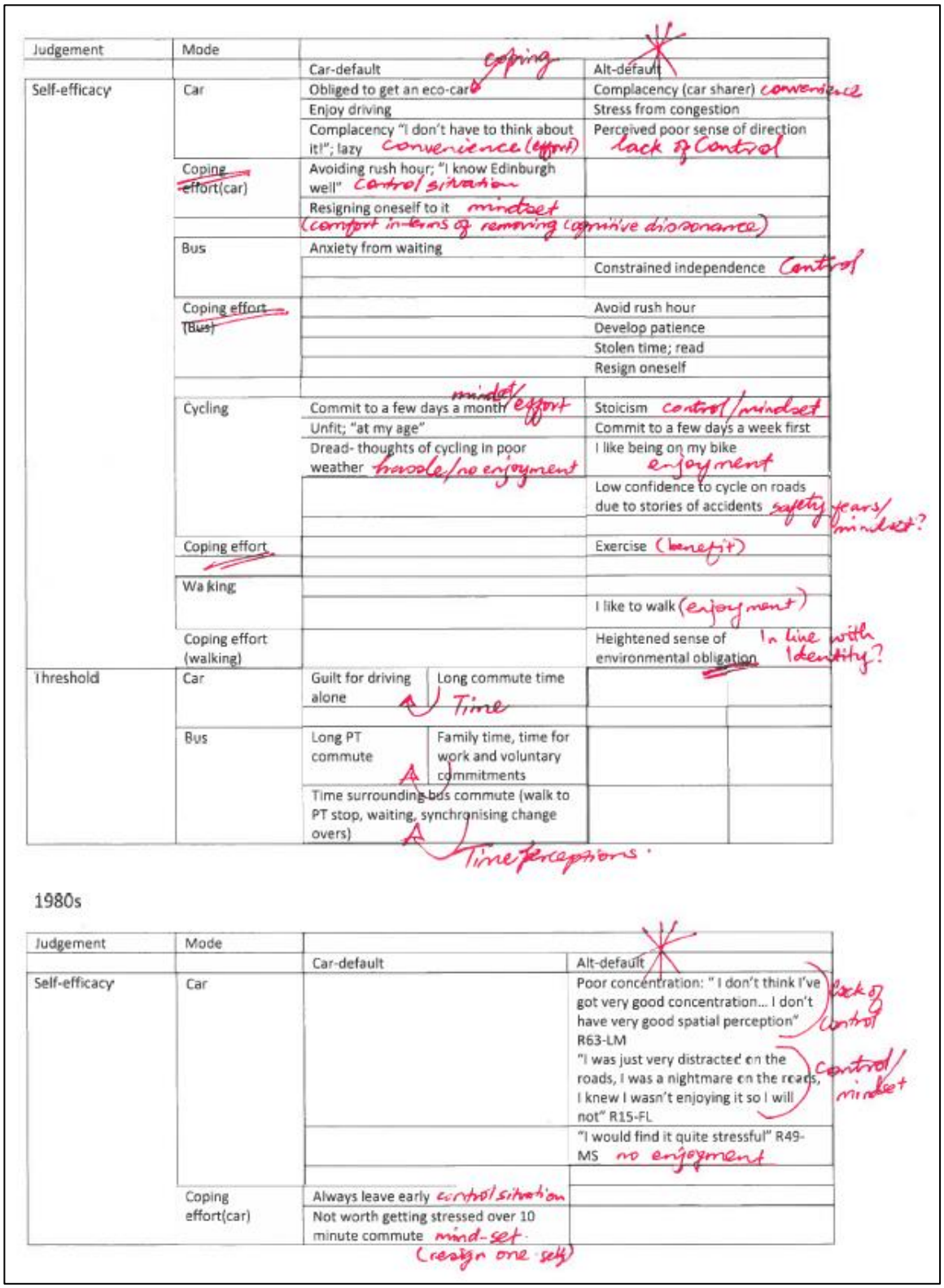


Figure 4.6: Initial coding of perceptions associated with the commute

By running matrix queries, these perception nodes were split along car - default and alt - default groups, and further along cohorts. The nodes and text within was then split and tabulated into those which were in anyway related to self - efficacy such as mastery experiences and incompetence feelings; coping mechanisms; and the rest into general trade-offs between perceptions which at the time were labelled as thresholds. Figure 4.7 shows a sample of the many tables that were developed (The rest can be found in Appendix F).



Judgement	Mode	Car-default	Alt-default
Self-efficacy	Car	Obliged to get an eco-car	Complacency (car sharer)
		Enjoy driving	Stress from congestion
		Complacency "I don't have to think about it!"; lazy	Perceived poor sense of direction
	Coping effort(car)	Avoiding rush hour; "I know Edinburgh well"	
		Resigning oneself to it	
	Bus	Anxiety from waiting	
			Constrained independence
	Coping effort (Bus)		Avoid rush hour
			Develop patience
			Stolen time; read
			Resign oneself
	Cycling	Commit to a few days a month	Stoicism
		Unfit; "at my age"	Commit to a few days a week first
		Dread- thoughts of cycling in poor weather	I like being on my bike
			Low confidence to cycle on roads due to stories of accidents
	Coping effort		Exercise (benefit)
	Walking		I like to walk (enjoyment)
	Coping effort (walking)		Heightened sense of environmental obligation
Threshold	Car	Guilt for driving alone	Long commute time
	Bus	Long PT commute	Family time, time for work and voluntary commitments
		Time surrounding bus commute (walk to PT stop, waiting, synchronising change overs)	

1980s

Judgement	Mode	Car-default	Alt-default
Self-efficacy	Car		Poor concentration: " I don't think I've got very good concentration... I don't have very good spatial perception" R63-LM
			"I was just very distracted on the roads, I was a nightmare on the roads, I knew I wasn't enjoying it so I will not" R15-FL
			"I would find it quite stressful" R49-MS
	Coping effort(car)	Always leave early	
		Not worth getting stressed over 10 minute commute	

Figure 4.7: Sample of coding of the commute goals

The text in the tables was then manually coded for a variety of commute goals such as cost, time, enjoyment, convenience, control etc.

4.5.3 Conclusion

This chapter presented how the commuting history narratives of 82 respondents in Edinburgh were collected and analysed using the narrative approach. The narratives were collected using retrospective in-depth interviews and analysed using Schutze's narrative analysis approach which involve indexical data mining and non - indexical data mining or thematic analysis.

Indexical analysis is aimed at identifying broader categories within the data. The following categories were identified:

- Two current default commuting mode categories, that is, those currently commuting by car (car - default); and those currently commuting by alternative modes such as public transport and bicycles (alt - default)
- Five key events along the life course, that is: Further Education; Start of the first job; Start of a family; Moving to the current home; and Moving to the current job. In addition to these key events, four mode related events were also identified as when one: Acquired driving licence; Started a regular car commute; Broke from a regular car commute; and Resumed a regular car commute.
- Three cohort groups, that is, those who were or turned 17 (age at which one can acquire a diving licence in the UK) in the 1970s, the 1980s, or the 1990s and onwards

Non - indexical data mining and thematic analysis was carried out on narratives within these groups and used to develop generalised travel script representations or diagrams at each of the five life cycle key events mentioned above. These travel script representations are used in Chapter Five to discuss the various knowledgeability factors that are assimilated - accommodated into the generalised travel scripts; and how they enabled or constrained the commute at different key events; and how the travel script representations of respondents within the car - default category compared with those in alt - default.

The cohorts and current default commuting mode categories were used to develop six collective trajectories or life courses, that is: 3 car - default life courses (1970s, 1980s, 1990s onwards) and 3 alt - default life courses (1970s, 1980s, 1990s onwards). Through thematic analysis of narratives in these trajectories, turning points for the commuting trajectories are identified. Analysis of the attributes surrounding these turning points is

instrumental in identifying two self - identity groups as the discussion in Chapter Six will show.

The thematic analysis also teases out the commute goals such as cost, time, convenience, and control; as well as the different coping strategies engaged. The discussion in Chapter Seven uses this analysis to show how these commute goals are satisfied and that their satisfaction, as well as the coping strategies used, is in line with one's perception of their self - identity, as expressed through the commuting behaviour.

Chapter 5: Key Events, Travel Knowledgeability and Travel Scripts

5.1 Introduction

This chapter explores the knowledgeability factors that are assimilated and accommodated into the travel script. It seeks to answer Objective One - *how commuters above 30 years construct travel scripts along their life courses* - and its underlying research questions by:

a) Presenting the various knowledgeability factors mentioned by respondents
b) Situating these factors into different key events that occur along the individuals' life courses. These, as identified in Chapter Four are: further education; first job; having children/ starting a family; moving to current home; and moving to current job. Due to time constraints and the use of retrospective information, the assimilation - accommodation processes cannot be tracked to show the elements as they are incorporated into the travel scripts. The assimilation - accommodation process is assumed by the changing content of the travel script along the life course.
c) Discussing how these knowledgeability factors enabled or constrained commuting at the different key events: showing those that were accentuated and therefore significantly influenced the travel script at that key event; others that could be drawn upon in slightly differing situations; and other factors that are down played.

All the above is discussed as a comparison between car - default and alt - default respondents as well as any glaring differences between the collective trajectories at the key events. Individuals will be exposed to a number of situational factors such as change of residence or job, increase in income as careers progress, or having children; and will experience and form a myriad of attitudes related to the travel behaviour, the mode, the locations of different activities, etc. All these are assimilated and accommodated into one's mental structure. As a generalised script is formed through evaluation of the knowledgeability factors, certain elements such as the time and distance taken for the commute, the number of connections required to complete the commute or the costs associated with the commute, are filtered from the categorical and episodic scripts. When this generalised script is engaged in a particular situation, certain elements are accentuated and others downplayed. This is elaborated in the following

section which discusses the evolution of a generalised travel script as conceptualised in this research. Subsequent sections focus on the generalised travel scripts specific to each key event.

5.2 Evolution of a Generalised Travel Script

Chapter One defines a travel script as a mental structure of the individual's knowledgeability of the structures within which they are situated. Structure was also defined as rules - resources set, and exists in the things we know, and the way we put them into practice. Giddens (1984) cautions that a structure is not to be equated with constraint but is always both constraining and enabling. From the analysis of the transcripts, constraints to and enablers for different modes are identified as "the things we know" - the knowledgeability - and the mode chosen at each key event as "the way we put them into practice". The constraints are considered as the rules - the factors which limit the behaviour. The expense related to travel, unavailability of parking, or the awkward configuration of public transport, are all limitations one considers to guide their commute decisions. The enablers not only facilitate the success of the travel decisions taken to use a particular mode but are also the non-human resources available to commuter. The availability of a car, public transport, infrastructure for active travel or a social circle one can count on for travel are all resources that are used to enhance and maintain the travel behaviour.

It was also proposed that scripts evolve from episodic, through categorical to hypothetical or generalised scripts. The first commute experience at the time of each key event provides the context for the formation of an episodic travel script. When a respondent expressed that they frequently used a particular mode to commute, the underlying assumption is that they monitored the episodic scripts and arrived at an acceptable balance of all their knowledgeability factors. They have accentuated or downplayed knowledgeability factors in their travel script and have filtered out a decision. In so doing, their travel script develops from episodic to categorical. As noted in Chapter Four, a hypothetical or generalised script is developed from various episodic and categorical scripts of respondents belonging to a particular collective trajectory. The various constraints and enablers such as noted in figure 5.1 represent the categorical scripts - the range of related contexts expressed by respondent - surrounding script processing at a particular key event. (All the categorical script representations extracted from the narratives can be found in Appendix E)

External structure or knowledgeability for 1970s cohort surrounding further education

Structures exist in the things we know...		...and the way we put them into practice	
		Car-default	Alt-default
Constraints to: Car	Financial	Walk	PT
	Infrastructure (no parking)	PT	
Public transport	Configuration	Walk	
Active travel	Distance		PT
Enabler for: Car	Financial	Car	
	Infrastructure	Car	
Public transport	Availability	PT	PT
Car sharing	Friends and neighbours	Car share	Car share
Active travel	Close proximity	Walk	Walk
Other social enablers	Culture of town	Walk/ cycled	

External structure or knowledgeability for 1970s cohort at the start of the first job

Structures exist in the things we know...		...and the way we put them into practice	
		Car-default	Alt-default
Constraints to: Car	Financial	Bus	
	Infrastructure	Cycling/ Bus	
	Personal skill	Bus	
Public transport	Financial	Walk/ cheaper PT	
Active travel	Distance		Bus
Enabler for: Car	Skill		car
	Policy (company cars)	Car	car
Public transport	Availability	Bus/ Train	
Car sharing	Friends and neighbours	Car share	Car share
Active travel	Close proximity	Walk	walk
	Financial		cycling
Other social enablers			

Figure 5. 1: Sample of categorical scripts extracted from the narratives

The generalised script representation developed in this study shows mainly what is accentuated about the factors that constrain or enable the use of a desired mode. The enablers or constraints expressed by most respondents are taken to be those accentuated. The discussion provides more information on what may be downplayed and the commute goal aspired towards. The rest of the figures in this chapter (figures 5.2 - 5.11) represent these generalised scripts. The knowledgeability - "the things we know" - is represented by the red vertical text boxes denoting the constraints and the green horizontal text boxes denoting the enablers. "The way we put them into practice" is

represented by the grey lines which are modes chosen or switched to/from. As noted in Chapter Four, the thickness at the end of the grey lines denotes the likelihood to use a particular mode relative to another. The generalised script for a typical 1970s car - default respondent for a specific event such as further education, for example, would represent the cognitive structure surrounding the commuting decision for a hypothetical person fitting all that criteria. It would show the mode most likely used, by the thickness at the end of the grey lines; the constraints to different modes faced, by the vertically oriented red text boxes; and the factors that supported the use of different modes, by the horizontal green text boxes below the modes.

A script is concerned with guiding behaviour in specific contexts. In this research, the key life cycle events are used as the specific contexts. Travel knowledgeability relates to the information in the world related to travel and the commute. The constraints and enablers that make up the travel script are gleaned from the knowledgeability factors and bounded by the different key events for each cohort. In the following sections, the experiences of car - default and alt - default respondents are compared and the generalised scripts that arise at different key events are presented. The key events discussed are: further education; first job; having children/ starting a family; moving to current home; and moving to current job.

5.3 Further Education

This key event encompasses the period when respondents were at university or college. For most respondents, this period was characterised by leaving home and starting to live on their own. They also had to commute to and from their education institutions most days of the week although the time for the commute could depend on the study timetable. Due to this change, different external factors such as commute distances, available commute modes and the means available to access them had to be assimilated and accommodated into their travel script. With time, these factors together with other social - psychological factors such as comfort and perceived hassle would be evaluated to arrive at a generalised script. The discussion below focusses on the external constraints and enablers at this key event.

5.3.1 Constraints: Financial; Infrastructure and Proximity

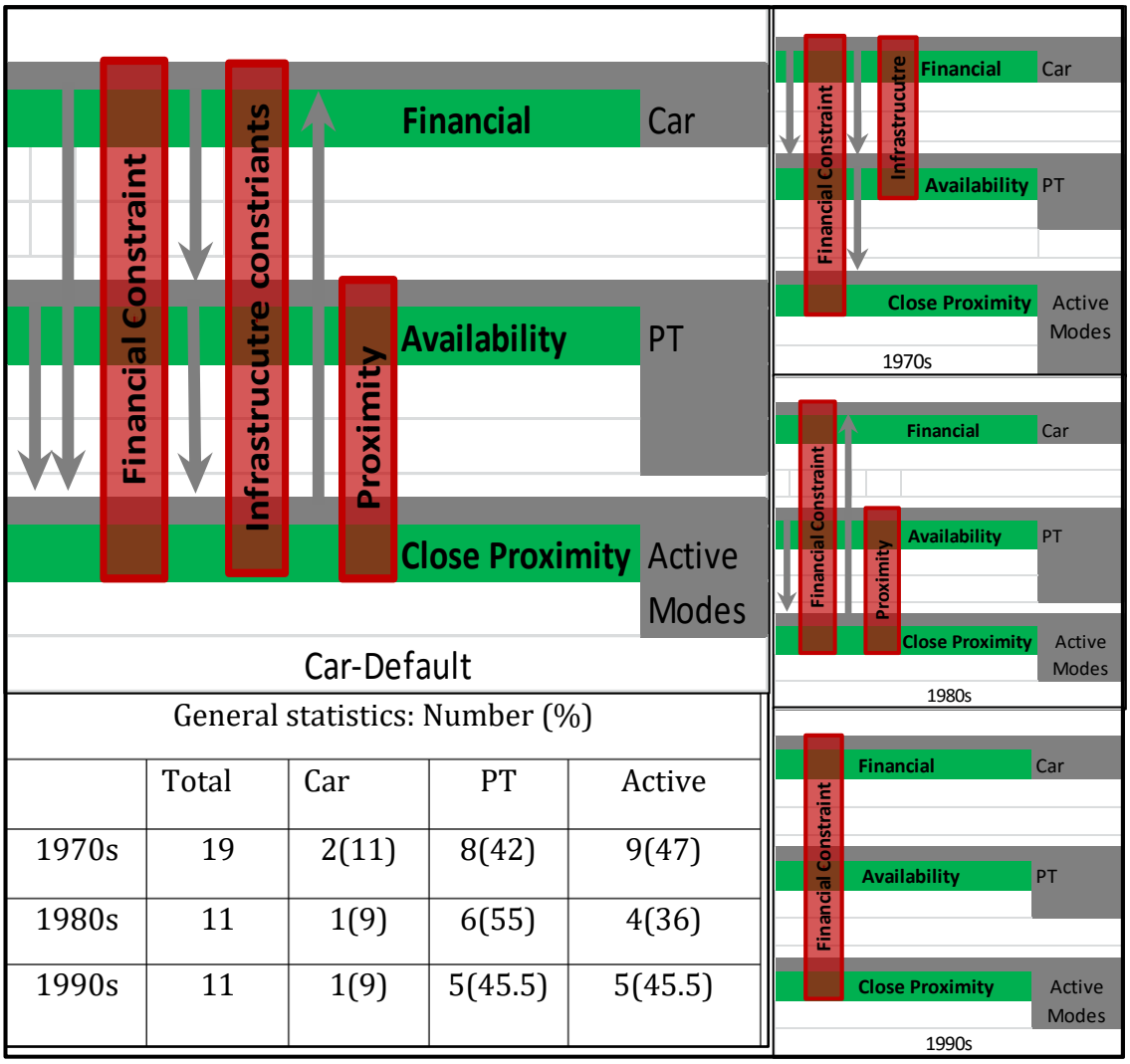
In general, car and alt - default respondents accentuated similar constraints at this key event namely: financial, infrastructure and proximity constraints. Financial constraints are the most remarked on constraint and therefore the most accentuated knowledgeability factor for the travel scripts at this key event.

> "I guess it's an affordability thing really rather than a lifestyle choice, because as a student, you couldn't afford a car so…" R25, 40 year old mother of 2

> "I didn't own a car so mostly walking and cycling to the different campuses from where I happened to be…obviously when you're at university, (you are) trying to minimise cost and having a car wouldn't have been sensible," R58, 37 year old recent father

As the vertical arrows before the financial constraint show in figures 5.2 and 5.3, this influenced the choice of public transport or active modes over the car for commuting. It is generally accepted that at this event, faced with this constraint, most students, even though they might have a driving license, are inclined to the cheapest means of travel or ways to save money. Active travel and public transport offer this. R48, 42 year old father of 1 demonstrates the weight of this constraint at this stage.

> "Then university, in my first year I was on campus I walked everywhere got the bus whatever, I got a car in my second and 3rd year because I lived 4 miles away from campus so we used to share lifts going in" R48, 42 year old father of 1



General statistics: Number (%)

	Total	Car	PT	Active
1970s	19	2(11)	8(42)	9(47)
1980s	11	1(9)	6(55)	4(36)
1990s	11	1(9)	5(45.5)	5(45.5)

Figure 5. 2: Generalised scripts for car–default respondents at further education

The financial constraint and its influence seemed to be complemented by the infrastructure constraints for respondents in the 1990s car - default trajectory or life course at this key event. Even where one had a car, there was a tendency to share lifts in order to share costs. The few students from the 1970s cohort who overcame the financial constraint related to car ownership noted a lack of parking at their education institution and so took public transport. Infrastructure constraints against car use were only expressed by the 1970s car - default respondents as figure 6.2 shows.

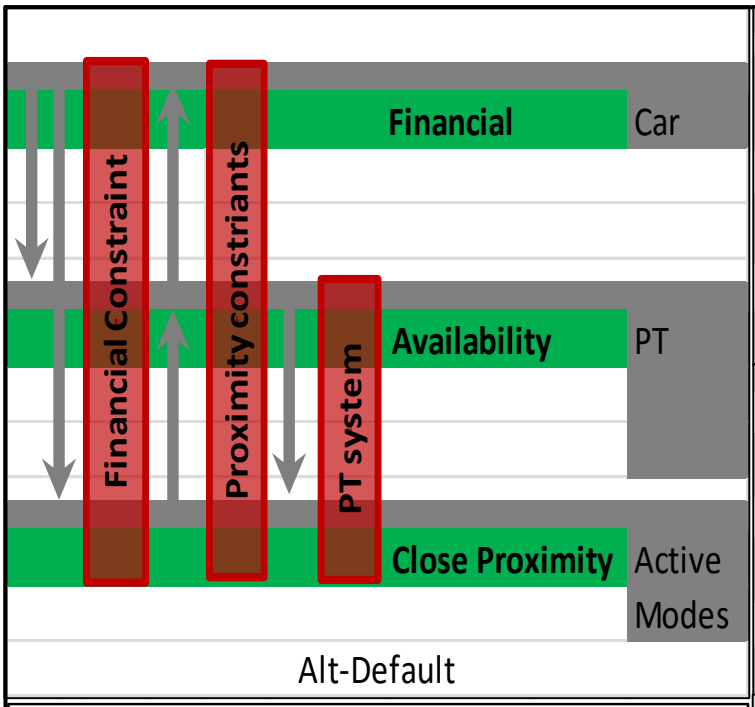
> "I did have a car during the time I was at university. The university, this was in Aberdeen, was on 2 or 3 different sites, the parking was quite difficult close to the main college so when we had classes there, I would tend not to use the car, when we had classes at the other campus where there was more parking then I would tend to use the car." R75, 60 year old father of 2

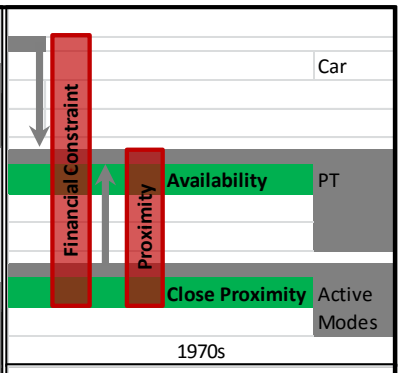
This was echoed by the respondents from other cohorts who had cars during their time at university. Apart from the financial constraints, it seems that the mere availability of the car made it the first choice unless there was no real benefit to it, such as, having to walk part of the way because one could not get parked close enough.

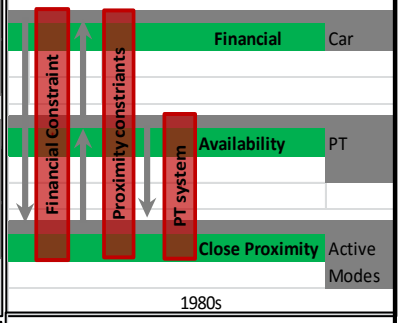
Infrastructure constraints against public transport were expressed by both the 1970s car - default and the 1980s alt - default respondents (Figure 5.3). The infrastructure constraints related to public transport were mostly an awkward configuration of the public transport which required a change over or took a longer route.

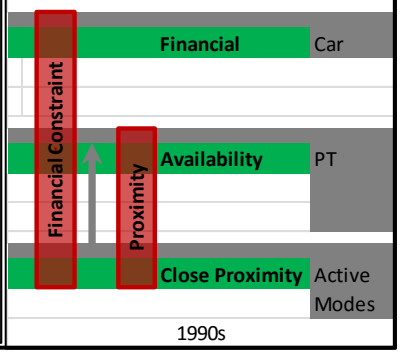
> "Then I went to college which is again about a mile and a half so I walked because there was no direct bus route" R20, 54 year old father of 2

It seems that the awkward configuration of the public transport rendered its advantage of speed over active modes obsolete. The cheapness of active travel then made it more attractive than public transport. A few other respondents, however, even though they faced public transport constraints had no other choice but to use this mode. The long distance to their further education institution was the most significant deterrent for active travel.









General statistics: Number (%)

	Total	Car	PT	Active
1970s	9	-	5 (56)	4(44)
1980s	9	1(11)	4(44.5)	4(44.5)
1990s	11	1(9)	7(64)	3(27)

Figure 5. 3: Generalised scripts for alt - default respondents at further education

Proximity constraints denote the limitations expressed in using a particular mode because of the commuting distance involved. As figure 5.3 shows, this constraint is expressed mostly by alt - default respondents regardless of cohort, in relation to the use of active modes.

> "Then I went to university and at university, I cycled to university from wherever I was because it was too far to walk." R47, 49 year old father of 1

> "And then university, I came to Strathclyde University so at that time it was mainly the bus, occasional walk because I lived very far away from the university campus." R41, 59 year old mother of 2

The quotations above illustrate that for the most part, the switch between modes due to distance was kept among public transport, walking and cycling, possibly because the financial constraints limited the use of the car. Exceptions are always expected and

these were presented by a few respondents in the 1980s cohort, both car - default and alt - default, for whom proximity constraints influenced the switch from public transport or active travel to the car. This simply illustrates the "generalness" of the hypothetical script. Therefore, even though for the most part, financial constraints are accentuated, if conditions changed and the locations involved were very far apart and remote, the script engaged would be modified to achieve the use of a car.

5.3.2 Enablers: Close proximity; Availability; Financial

If long distances were the biggest constraint to active modes then close proximity should be and was indeed its most expressed enabler. Public transport was enabled by its availability while very few respondents were able to afford having a car. Figure 5.2 shows that for car - default respondents, just as many respondents used public transport as active modes to commute. A look at particular cohorts' scripts shows that the majority of 1970s car - default respondents commuted by active modes while most 1980s respondents commuted by public transport. In addition, active travel in the 1970s at this stage was more walking while in the 1980s, people cycled more than they walked. Some respondents ascribe their active commute to the fact that the town they studied in had a culture of active travel.

> "Then university, (I) always walked, I went to university in …, it's a campus town, a university town so everything was in walkable distance." R76, 40 year old single woman

This can be considered as a facet of the proximity factor as these towns such as St. Andrews, Scotland are known to be "walkable" towns. The active travel culture of these cities possibly further motivated active travel because as some noted, it is "what everybody did."

Majority of respondents, but most especially alt - default respondents, used public transport to travel at this key event. This was largely due to the availability of a direct public transport route close to their home and education institution. The availability of public transport was especially important in cases where active travel was constrained by long distance.

> "…at first I lived about 10 minutes' walk away from the department so I walked then and then they moved out… to Little France near the royal infirmary and

when they did that I got a bus pass again, it was quite a long way." R13, 34 year old single woman

Public transport incentives such as the bus pass mentioned above further motivated its use. This was more so for those respondents whose further education was in countries such as Germany or the Netherlands where the policy of their cities allowed students to have a heavily subsidised public transport ticket and the transport infrastructure was such that they lived in proximity to metro lines or other public transport lines. These respondents also noted that public transport was even more attractive because of the limited or charged parking at their institutions. As mentioned earlier, unless the car was made unattractive by such constraints, respondents who could afford to have a car at this key event used it to commute.

To engage the travel script for commuting by public transport or active modes at this key event, their enablers, that is, availability and close proximity respectively; together with the financial constraints against the car seemed to be accentuated complementary to each other. The needs or preference for the commute at this point in the life course to be cost effective seemed to be satisfied by these scripts. These constraints and enablers can be said to have been the most salient elements of the knowledgeability that the commuters drew upon at this point in their life course. In addition, the constraints and enablers can also be said to be the rules and resources that formed the mental structure surrounding the decision to commute at the time of further education.

The reflexivity of structure and agency at this key event is only apparent in the acceptance of circumstances at this stage in most people's lives. The close proximity between the education institution and residences, the availability of public transport as well as the limited income created both an external structure and a mental structure that significantly influenced the decision to commute by public transport or active modes. However, the acceptance of the circumstances especially that of the limited income at this point in people's lives can be argued to have contributed to the reproducing of this structure. As noted in the discussion, it was the norm that at university or other tertiary education, one was expected to minimise costs and therefore, apart from exceptional circumstances, not owning a car would have been the sensible thing to do.

This also hints, though not very clearly, at the duality of structure. The close proximity, availability of public transport and the financial constraints are clearly seen to be the medium through which commuting by public transport or an active mode is practiced. It

is not clear whether this structure can be considered an outcome of recurrent commuting with these modes, but it is only a reasonable assumption that recurrent commuting with these modes would reproduce this structure.

5.4 First Job

This key event denoted the period immediately following the start of the first job in a particular career. Most respondents started their first job after university or college while a few started their first job after secondary school. Like the previously discussed key event, this change necessitated the accommodation, assimilation and, with time, evaluation of commute related factors such as: new locations and distances; and the attributes of the available means of travel.

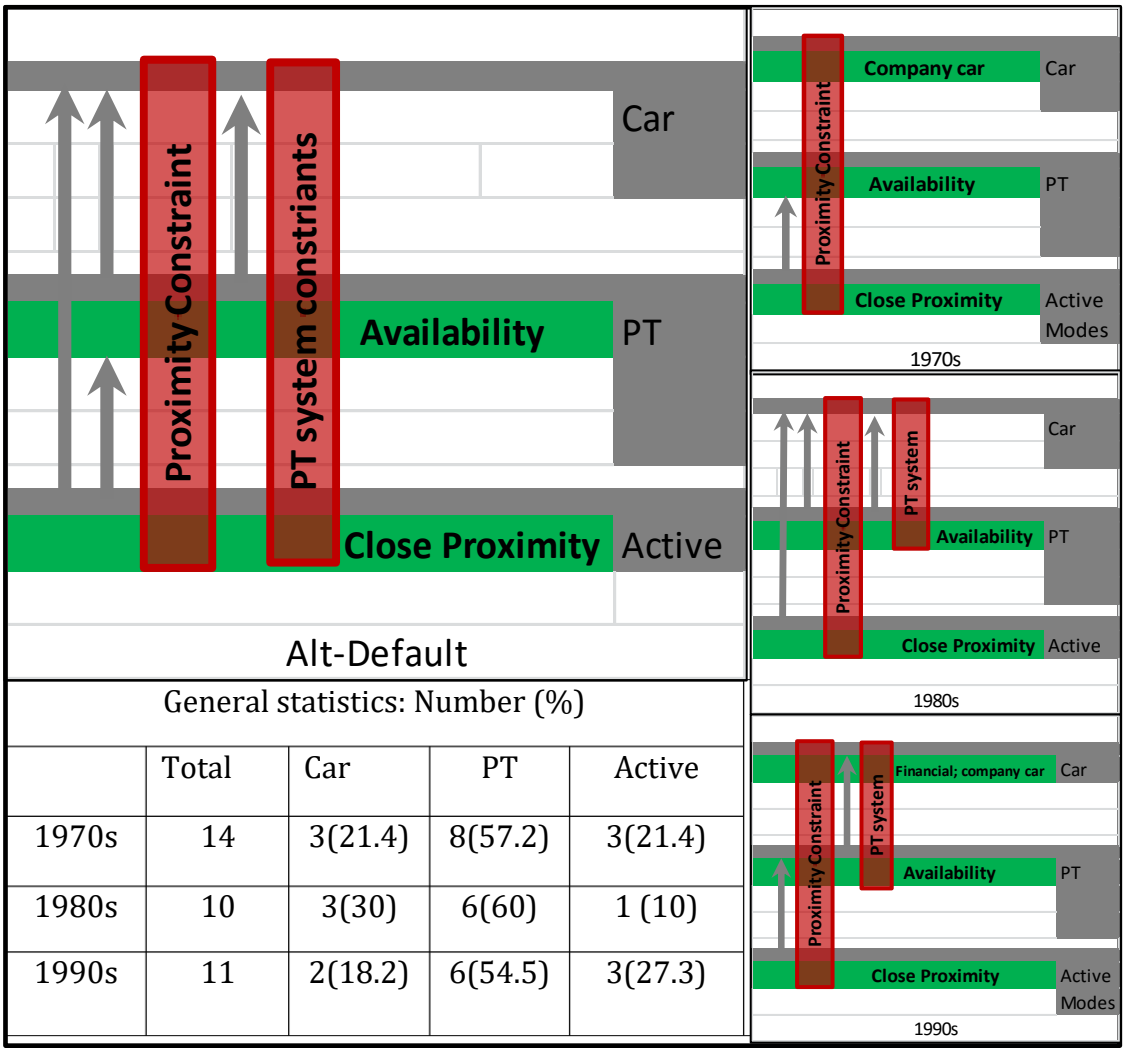
5.4.1 Constraints: Proximity; Infrastructure; Financial

At this key event, respondents faced the same constraints as at further education, that is, proximity, infrastructure and financial constraints. Proximity and infrastructure constraints were in this instance accentuated more than financial constraints. A look at the generalised scripts shows that regardless of cohort or whether they are in the car or alt - default groups, most respondents used public transport to commute at the start of this key event. A number of respondents were unable to sustain their active commute as they transitioned from further education to their first job, necessitating their move to public transport.

Alt - default respondents perceived the distance to the work place as too far for walking or cycling. The long distances also had a few other respondents switching to the car.

> "When I first worked there, I stayed with my parents who lived 30 miles outside Aberdeen, that's why I drove…" R6, 44 year old single woman

> "I did have a car because of where I lived, so there wasn't a convenient bus, I was living further away from where I was working so I had a car and I drove to work…" R52, 39 year old mother of 2



General statistics: Number (%)

	Total	Car	PT	Active
1970s	14	3(21.4)	8(57.2)	3(21.4)
1980s	10	3(30)	6(60)	1 (10)
1990s	11	2(18.2)	6(54.5)	3(27.3)

Figure 5. 4: Generalised scripts for alt–default respondents at the start of the first job

The quotations above highlight some of the infrastructure constraints related to the use of public transport expressed at this stage. The constraints to public transport such as the awkward configuration were expressed as reasons for switching from public transport to the car and not to active modes as figures 5.4 and 5.5 show. On the other hand, a few respondents in the 1970s car default group expressed parking constraints to car use at their first job (Figure 5.5). Some expressed that being new at the job, they had to "earn" their parking space. Others worked in city centres where it was difficult to park.

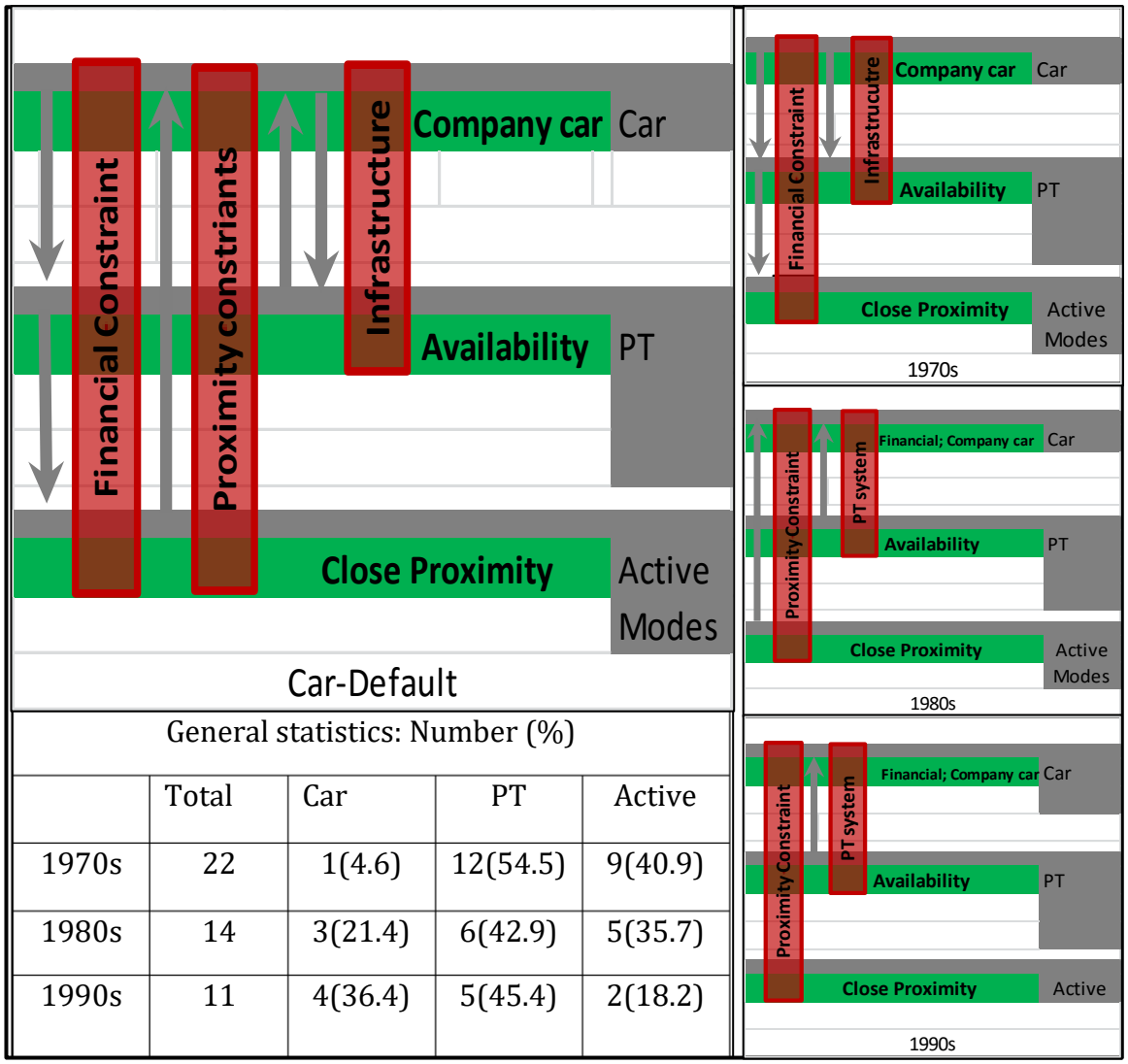
The other constraint against the car was financial and was only expressed by the 1990s and 1970s car - default respondents as figure 5.5 shows.

> "…I was posted to Peterhead which is about 30 miles north of Aberdeen which of course at that time I didn't have a car … In those days money was quite tight

> and a car was a luxury and for the first 3 or 4 months until I could find a home and move the family up, I used a train service from Dundee to Aberdeen and then from Aberdeen to Peterhead was the bus service which seemed to be interminably slow, it used to take ages to get to every single little village on the route."
>
> "… in my early career … I really didn't have a lot of choice in terms of the city that I would end up living in because that was caused by promotion. It was never seen as a good career move to actually refuse a move so if for example I didn't like the idea of Peterhead and I said well actually I don't want to go there sorry, the chances were at that time that if another opportunity came, that would be seen against me." R14, 56 year old father of 3

The impact of the financial constraints seems to have been more severe for the 1970s cohort. At the time most of them started their careers, there seemed to be little choice in the location of the job so people had to endure longer public transport commutes. Respondents in the 1990s car - default group on the other hand seem to have faced much shorter periods of financial constraint impeding car ownership.

While the generalised scripts show that more people used public transport at this key event, Chapter Six will show that for some groups, this mainly denotes the period immediately after starting the first job when they could not afford a car. With improved finances or access to company cars, these respondents' travel scripts evolved to a commute by car.



General statistics: Number (%)

	Total	Car	PT	Active
1970s	22	1(4.6)	12(54.5)	9(40.9)
1980s	14	3(21.4)	6(42.9)	5(35.7)
1990s	11	4(36.4)	5(45.4)	2(18.2)

Figure 5. 5: Generalised scripts for car–default respondents at the start of the first job

5.4.2 Enablers: Financial; Availability; Close Proximity

As noted in section 5.4.1, the biggest enabler for the car commute was improved financial conditions or access to a company car for work.

> "… I worked for a … company in Stirling and that had a company car with the job and it was 45 miles each way so it's a 90 mile commute and I wouldn't have taken the job if it wasn't for the fact that I got paid for my petrol because it would have cost me a fortune to get there and back." R30, 42 year old father of 3

> "My first car was actually a company car, I learnt to drive at 20 but I didn't start driving really until 24 and that was because I need to drive for my job, so they gave me a company car…" R17, 40 year old mother of 1

It is important to note that this financial or company policy enabler did not influence the commute as a standalone factor. Some of the respondents who commuted by car needed it for work. Some of the jobs such as sales and marketing required one to travel during the day to a client's offices. Other jobs like in laboratories required working at night when the public transport was less reliable.

As with the previous key event, the main enabler for public transport was the availability of a direct public transport route.

> "(I) had a 30 mile commute when I was living in England so I was going into Birmingham to work and I most of the time took the train so I walked to the station took the train and walked at the other end because there was a really convenient train station about a mile down the road from my house and a train station about half a mile from my office." R48, 42 year old father of 1

As illustrated above, the availability of a direct public transport route enabled its use even for a few commutes over long distances.

Shorter distances between one's work place and home generally enabled walking. Many of those who reported walking to their first jobs worked and lived in or close to the city centres.

> "My first job, when I moved up to Glasgow, my first main job up here, I lived in Dennistoun and I worked in Charing cross so I used to walk to work most day, occasionally caught the bus mainly in bad weather but it was actually quicker walking because by the time the bus, you had to wait for the bus and then it had to go through all the traffic jams and all the rest of it, it was actually quicker to walk to work, that was about 2 miles," R32, 50 year old mother of 2

Living in or close to the town centres also availed these respondents with public transport when the weather was poor.

The factors assimilated and accommodated into the travel script at *Further Education*, that is, financial, infrastructure and proximity constraints; and availability and close proximity enablers seem to have been re-evaluated at this key event due to changing circumstances. Therefore, proximity and infrastructure constraints are accentuated over financial factors at the start of the first job.

Just as was noted in the conclusion of the discussion for *Further Education* in the previous section, these constraints - financial, infrastructure and proximity - and enablers - availability of a direct public transport route and close proximity - form the knowledgeability and structure within which a commute by public transport is performed at this point in individuals' life courses. It is clear that with changing circumstances, reflexive monitoring and rationalisation based on the changing knowledgeability occurred.

Here again, the reflexivity of structure and agency is shown as individuals exercise their agency through reflexive monitoring of the changing structure. Through this reflexive monitoring, the mental structure or travel script changes from that used at *Further Education* to the one used at is key event of *First job*. In turn, this travel script guides the decision to commute mainly by public transport and later as respondents' careers grow, to a commute by car for those in the car - default group.

The duality of structure is also clear in this discussion as these elements of the structure - the enablers and constraints - are seen to be the medium through which the commuting behaviour is performed; and the recurrent commute by public transport or later by car, reinforces them as the enabling and constraining structure.

5.5 Having Children/ Starting a Family

This key event encompasses the period following having children. For the respondents who had more than one child, this period was prolonged as the changes faced when the first child was born reoccur with the subsequent children. This would add on to the complexity of travel related factors that were assimilated and accommodated in the travel scripts at the time. Almost half of the alt - default respondents did not have children while majority of car - default respondents had children. A small proportion of 1970s respondents, all women, stopped work for four or more years from the time they had their first child. They reported that at the time, it was the norm for women to stop work and some further expressed that they never expected that they would work again after they had their children. The following discussion considers the most expressed constraints and enablers when respondents started a family.

5.5.1 Social Constraints

The dominant constraint at this key event as shown in figures 5.6 and 5.7 is the social constraint. The social constraints expressed related to having to juggle children's

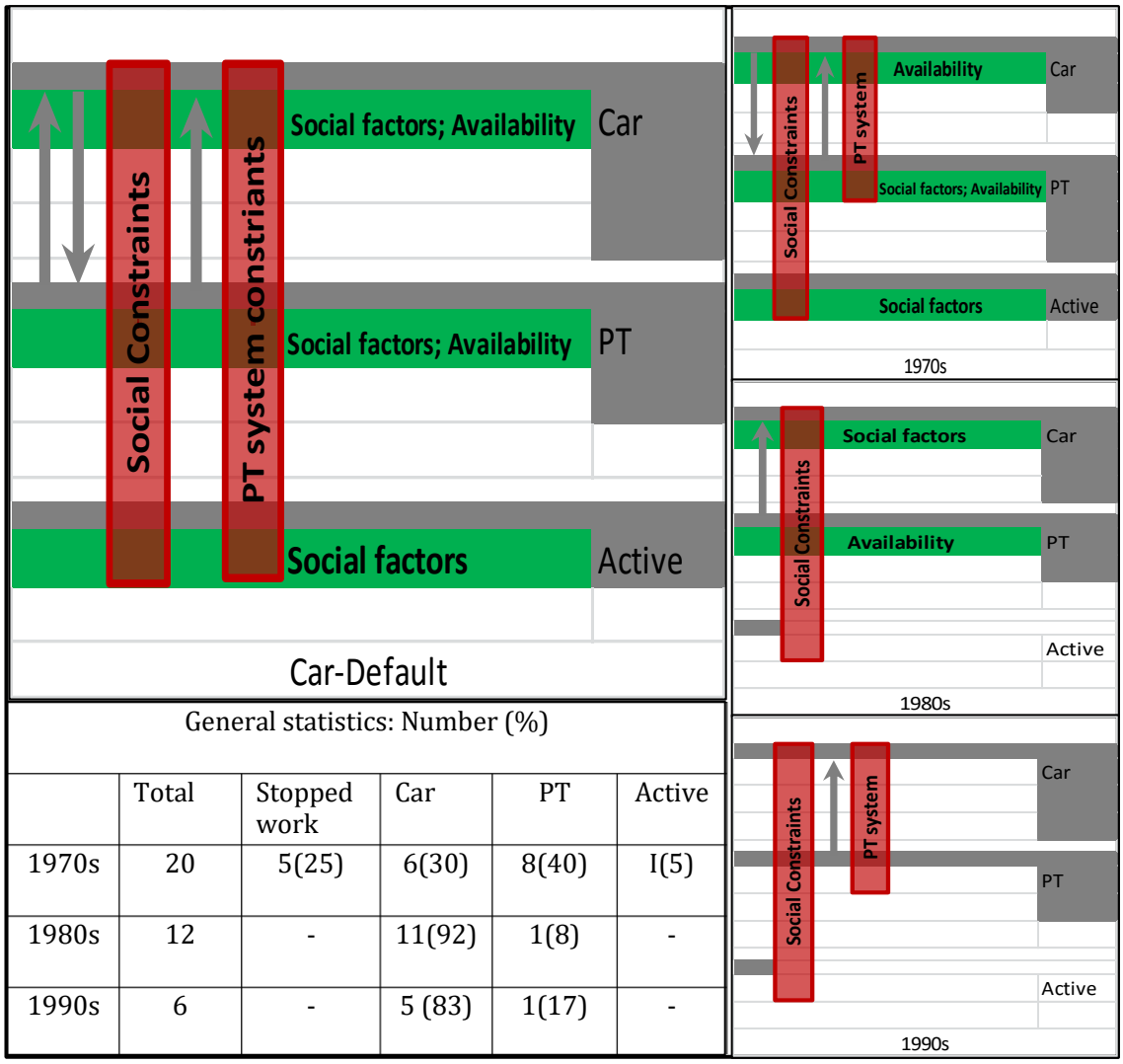
activities like school runs or after school clubs with work and other social commitments. Many respondents therefore used the car to commute at this key event. Mothers in particular, even though some worked part time found themselves trying to work the hours that the children were in childcare and having to rush back to collect them.

> "… the location for me of the nursery and my home and my place of work wasn't straight forward enough to just be two parts of the journey and I wasn't working flexibly so the times were quite tight to get from nursery to work and then work back to nursery. But when they are at primary school, that's even more complicated particularly when you've more than one, one might be at nursery; one might be in school, so you might be doing 2 or 3 pickups from different places just at the start and end of the day and then the afterschool things beyond that…" R37, 45 year old mother of 2

The quotation above illustrates how important it was for these working parents to have more control over their time. One respondent reported changing jobs to one where she not only had the flexibility to work part time and be home by the time the children got back from school, but also, where she could drive to and fro in the least amount of time possible. R54, 61 year old mother of 2, further illustrates the thought process at this key event that further motivates mothers to commute by car.

> "…obviously when you've got children, there's not always occasions when you've got to be home like an emergency but you've always got that at the back of your mind."

With public transport, this would involve more awkward trip chaining - having to walk to the various bus stops close to home, to school or to work. Indeed, a respondent noted that they felt their public transport commute was "harassed" due to the time constraints. It is therefore interesting to note that for some respondents, while social constraints remained the most accentuated in the travel script, it produced the opposite effect. Many fathers used public transport at this key event because they were also constrained from using the car by social factors. For these respondents, their partners took over the running of the children to various activities and therefore needed the family car for that.



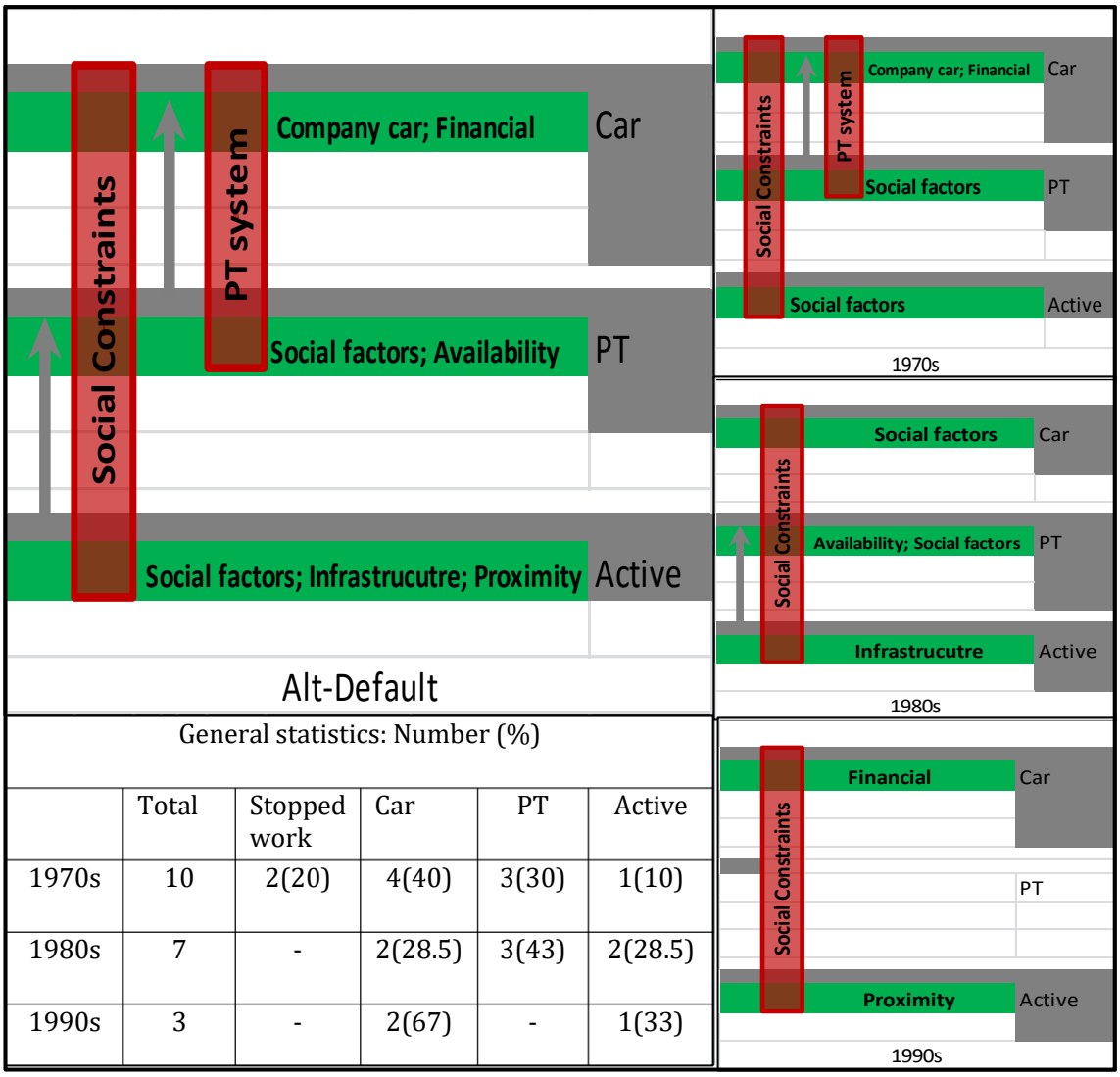
General statistics: Number (%)

	Total	Stopped work	Car	PT	Active
1970s	20	5(25)	6(30)	8(40)	I(5)
1980s	12	-	11(92)	1(8)	-
1990s	6	-	5 (83)	1(17)	-

Figure 5. 6: Generalised scripts for car–default respondents at *starting a family*

5.4.2 Enablers: Social; Availability

While social factors constrained the commute by alternative modes, the availability of a family car made the decision to commute by car much easier. For one respondent, social factors related to their social circle actually enabled a more sustainable commute. R1, a 34 year old father, finding that his partner required the family car for the child's activities, took advantage of living close to family. He bought a car with his brother and together with another family member car share daily and are able to keep their commuting costs down. Like R1, a number of respondents, especially in the 1980s car - default group already commuted by car before they had children. The social constraints faced at this stage, therefore, seem to be assimilated and accommodated in such a way that reinforced the travel script already being engaged for the commute.



General statistics: Number (%)

	Total	Stopped work	Car	PT	Active
1970s	10	2(20)	4(40)	3(30)	1(10)
1980s	7	-	2(28.5)	3(43)	2(28.5)
1990s	3	-	2(67)	-	1(33)

Figure 5. 7: Generalised scripts for alt–default respondents at *starting of a family*

Respondents whose commute was unaffected by time constraints arising from children's activities were only able to continue with their cycling or bus commutes because their partner minded the children. Some 1980s alt - default respondents, though affected by these time constraints, seemed able to continue with their alternative modes due to help from their social circle (figure 5.7). Some reported having family close enough to help with child care related activities; one reported certain flexibility at their workplace that allowed the extra 30 minutes needed to drop the child off; and another made use of the nursery situated at their work place:

> "For a while they were at the nursery on campus and so depending on what the weather was like, I would come on the road or on the canal but with the children on the bike seats, I always went on the canal, I didn't want to take them on the roads." R29, 50 year old father of 3

A number of them had already situated themselves close to public transport routes or active travel infrastructure, and so the availability of this infrastructure enabled their alternative modes commute at this key event.

At this key event, the social factors are accentuated by both car - default and alt - default respondents, and can therefore be noted as the most salient knowledgeability factor for the mental structure or travel script at this stage in the life course. That they were accentuated as a constraint or an enabler seemed to be mediated by other factors such as: whether the respondent themselves was in charge of taking children to their activities; and the availability of public transport and close active travel routes. If the respondent' partner minded the children, then it is likely that this constrained the use of the car. If however, public transport and active travel routes were available and direct to both the children's activities and work, and then they enabled the engagement of a script for an alternative modes commute.

The reflexive monitoring and rationalisation of the changing structure of the travel script reinforced or led to the start of a commute by car for those who considered the social constraints insurmountable. The commute by alternative modes was reinforced for those who, in their reflexive monitoring and rationalisation, accentuated direct public transport and active travel routes between children's activities and work as an enabler.

5.6 Moving to the Current Home

This key event represents the period immediately following respondents' move to their current homes. On average, the 1970s cohort has been living in their current home for about 21 years; the 1980s cohort for about 9 years; and about 6 years for the 1990s cohort. The discussion below focusses on the constraints and enablers relating to the first few years following the move to the current home.

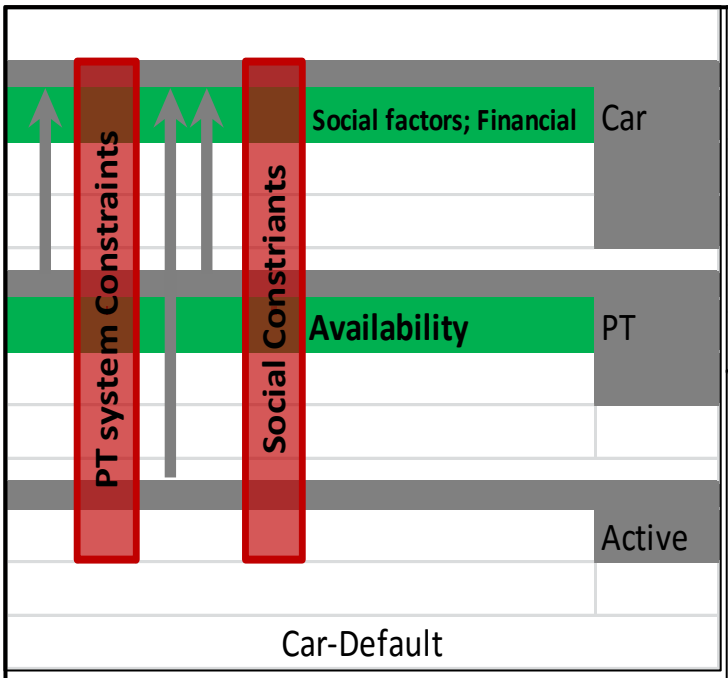
5.6.1 Constraints: Infrastructure and Social

One of the most pertinent aspects to consider at this life stage is the motivation for moving to where they did. For the 1970s cohort, the main reasons expressed were the need to move into what was perceived to be a more ideal environment to raise a family. The 1980s cohort express other social reasons such as: moving in with a partner or closer to a partner's job; moving closer to other family members who could help with child minding; or familiarity with the area. Lifestyle influenced choice of home for the

1990s cohort. Some wanted to be close enough to the city; others to be away from the city to make parking the car possible; and others, to live on their own. For all respondents, the financial aspect related to choosing a house was an important consideration.

> "I chose it for a number of reasons, the school, there was a house with a garden, planning kids, I used to stay in an Edinburgh tenement in the town centre which is great when you're young, free and single because I could walk into the pubs and clubs and things but the thing with family, you're wanting to have a garden so it was part of the deal for doing that as well and then being on the edge of Edinburgh, it was cheaper so it was cost implications as well." R20, 54 year old father of 2

House prices in areas on the periphery of Edinburgh are lower than in Edinburgh city centre and the surrounding areas. Majority of respondents especially in the 1970s and 1980s car - default groups, therefore, moved to the areas with lower house prices. Although this financial aspect influenced location, the constraint of the configuration of public transport seemed to be accentuated in the travel scripts at the time. The Edinburgh public transport system is such that all buses are directed towards or away from the city centre. Where public transport was available and direct, it enabled the public transport commute as will be elaborated in the next section. Those who worked in the city centre at the time found that public transport worked well for them. To get to a work place like Heriot-Watt campus which is also on the outskirts of the city, however, one faces a less straight forward journey that would definitely involve having to make at least one connection on the public transport route. Figure 5.8 supports this with the main constraint being the public transport system.



General statistics: Number (%)

	Total	Car	PT	Active
1970s	22	12(55)	8(36)	2(9)
1980s	14	10(71)	3(21)	1(8)
1990s	11	9(82)	2(18)	-

Figure 5. 8: Generalised scripts for car–default respondents at *moving to current home*

Almost half of the 1990s cohort did not have children. As noted above, their decision to settle where they did was based on lifestyle choices. Some of these settled along public transport routes or close enough for an active commute but still found themselves constrained by the need to get to recreational activities after work. Therefore for them, social constraints were the accentuated factor leading to the engagement of a travel script for a car commute.

5.6.2 Enablers: Infrastructure; Proximity and Availability

Many alt - default respondents did not express the aspect of moving to a perceived "ideal home environment" when they spoke about their commute at this key event. Many settled within 10 minutes of a public transport line or along cycle paths. This explains why figure 5.9 shows very few location related constraints such as

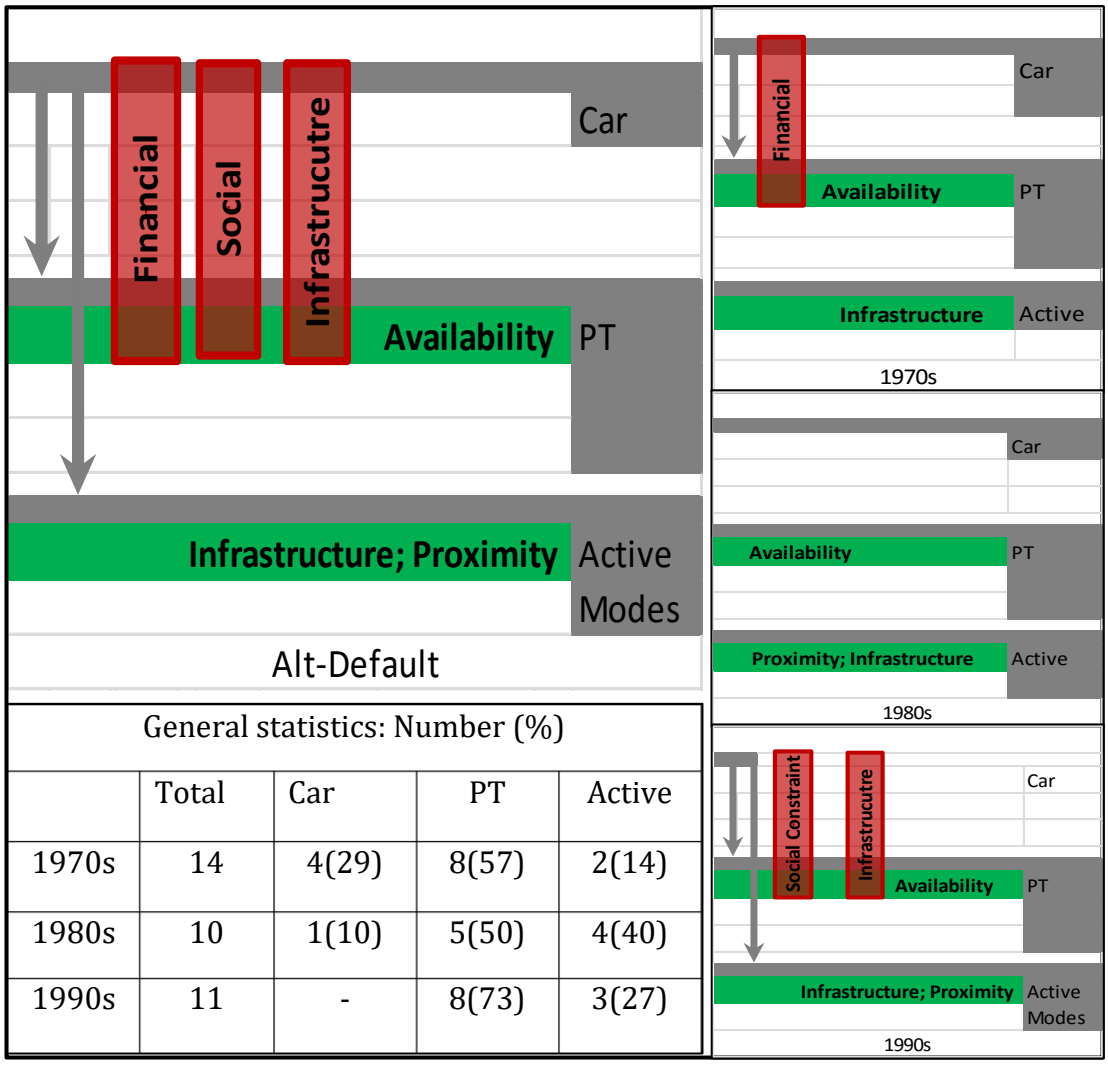
infrastructure constraints. They note proximity and availability of the infrastructure as enablers for public transport and active travel.

> "I ended up buying a house back in my home town in Falkirk which was not really my intention but houses were cheaper there, it just turned out that way and I deliberately bought a house which was close to the railway station so that I could travel to work easily and so I took the train, walked to the railway station which takes about 3 minutes and I'm still in the same house now and travelled by train every day back and forth to work and I found that to be convenient, relatively easy" R59, 51 year old mother of 2

For the respondents who do not have a driving licence such as R59, settling close to public transport links was a definite consideration aimed at enabling their travel. Alt - default respondents who hold strong personal beliefs regarding the environment also enabled their preferred mode by consciously choosing to live close to public transport lines or cycle paths; or actively investigating the alternative routes from their current home to the work place, as R72, 53 year old single woman remarked below:

> "…so when I bought this place … I didn't know then how I would cycle out to Heriot-Watt because it was obviously going to be further and either going through the centre of town was not going to be very pleasant but I find the cycle path network basically brought me from Heriot-Watt to my door which was just something I discovered afterwards."

It is clear that for some respondents at this stage, the situational factors did not greatly influence the engagement of a particular travel script. Other internal states such as environmental beliefs or attitudes influenced the situational factors experienced, thus enabling a travel script that would achieve the goal of an alternative modes commute.



General statistics: Number (%)

	Total	Car	PT	Active
1970s	14	4(29)	8(57)	2(14)
1980s	10	1(10)	5(50)	4(40)
1990s	11	-	8(73)	3(27)

Figure 5. 9: Generalised scripts for alt – default respondents at *moving to current home*

At this key event, the differences between the car - default and the alt - default respondents start to emerge. The generalised scripts in figures 5.8 and 5.9 show that the travel scripts for the car - default trajectories started to favour a commute by car while the travel scripts for alt - default trajectories favoured a commute by public transport. The reflexive monitoring of the changing situation and knowledgeability factors related to the location of their home, for respondents in the car - default group, accentuated the constraint of the configuration of public transport. For most, this was complemented by the social constraints brought about by their children's activities.

Public transport infrastructure constraints were downplayed by respondents in the alt - default group. The reflexivity of structure and agency is clearly illustrated by these respondents. They exercised their agency in their choice of residence; settling close to public transport links (including long train journeys for some) and active travel routes to

enable the commute by modes other than the car. For some of them, this exercise of agency was also motivated by strong environmental beliefs. In turn, the situation they chose enabled their commuting behaviour.

5.7 Moving to the Current Job

This key event denotes the period following the start of the job with the respondent's current employers. Most of the respondents found the employers already situated at the current Heriot-Watt University campus and research park. A small minority joined their employers before they relocated to the current location. On average, the 1970s cohort has been in their current job for about 15 years - approximately 6 years after moving to their current homes. The 1980s and 1990s cohorts have on average been in their current job for almost as long as they have been in their current homes, that is, 10 years and 6 years respectively. Below, the constraints and enablers assimilated, accommodated and, with time evaluated at this event to form the generalised script are discussed.

5.7.1 Constraints: Infrastructure and Social

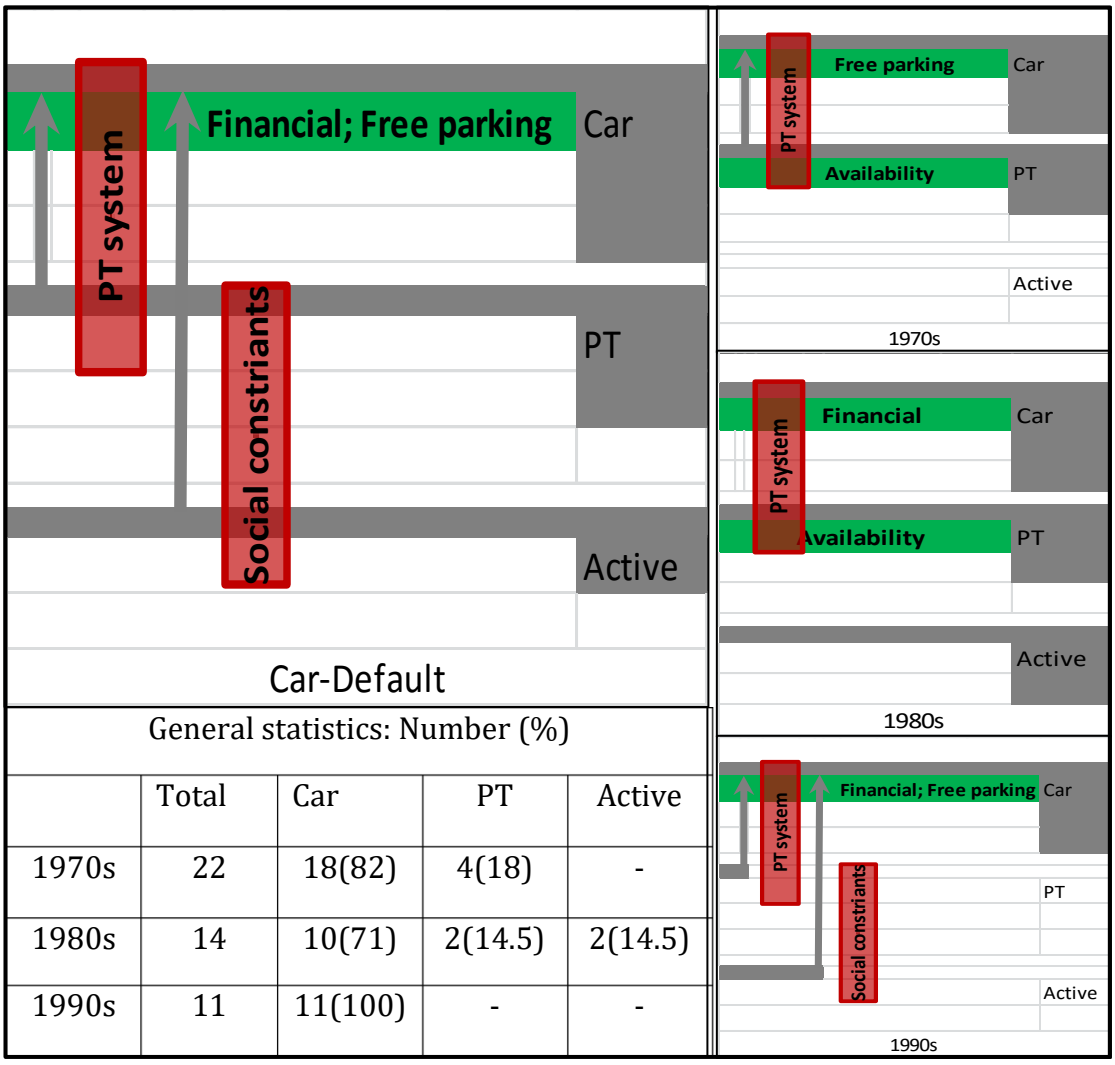
The constraints expressed at this key event are similar to the previous event. Figures 5.10 and 5.11 attest to this with their striking similarity to figures 5.8 and 5.9 respectively. This is probably due to the same location issues. Heriot-Watt is on the outskirts of the city therefore anyone travelling from the periphery to the Heriot-Watt campus faces a long public transport journey with at least one changeover. Between 1981 and 1993, Heriot-Watt moved its campus from the city centre to Riccarton at the outskirts. For respondents who were with Heriot-Watt from before the relocation, parking constraints in the city centre prevented their use of the car. These respondents commuted by public transport or active modes. After the relocation, car - default respondents who previously commuted by alternative modes started commuting by car.

> "When we moved up to Riccarton in 1992, I then started driving, I didn't use the bus service because a bus service is about 10 minutes' walk from where I am, it's unreliable …so the total journey took about ¾ of an hour." R26, 60 year old man

A number of 1990s car - default respondents expressed work related social constraints to alternative modes, for example, people unable to car share due to the different hours worked, or needing to get to meetings during the day. Others needed to get to recreational activities after work. The influence of these social constraints seemed to be

exacerbated by infrastructure constraints as figure 5.10 shows, and R47, 49 year old father of 1 illustrates:

> "I really should have cycled because that was only about 5 miles but I don't know if you've ever been on the Calder road, but it is not the safest road to cycle on in the world. It's a bit busy."



General statistics: Number (%)

	Total	Car	PT	Active
1970s	22	18(82)	4(18)	-
1980s	14	10(71)	2(14.5)	2(14.5)
1990s	11	11(100)	-	-

Figure 5. 10: Generalised scripts for car–default respondents at *moving to current job*

5.7.2 Enablers: Infrastructure, Proximity and Availability

Following the relocation of the Heriot-Watt campus from the city centre to Riccarton, a number of car - default respondents report that the free parking at the Riccarton campus is a bonus they are happy to receive.

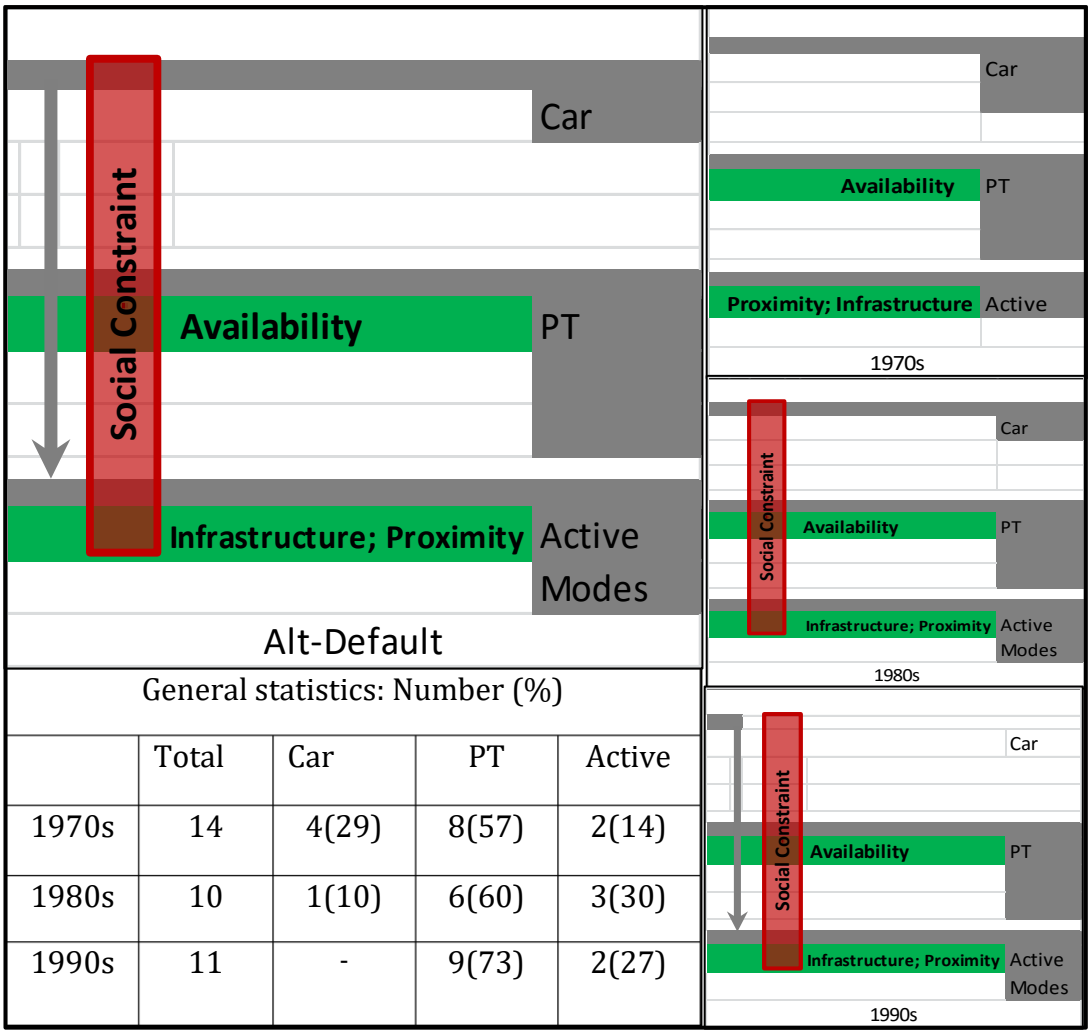
> "I tell you one of the good things about Heriot-Watt travel wise is free parking and for someone who has paid for parking for years and years, that was quite a bonus." R20, 54 year old father of 2

The free parking is by no means a standalone incentive for driving. This is confirmed by a number of respondents who when asked whether they would drive to work if there was a charge for the parking stated that unless it was an exorbitant amount, they would pay for the parking.

As illustrated by figure 5.11, the commute for alt - default respondents along bus routes or cycle paths was enabled by the availability of this infrastructure.

> "Then I came to this job and the main reason for this job is that I wanted to give up the car and this job was a direct 2 bus routes from my house and a very short journey." R4, 53 year old single woman

> "And I've recently started cycling, I thought it was a bit scary but I've recently started cycling a couple of times to Heriot-Watt because I live near the union canal…" R77, 32 year old married woman.



General statistics: Number (%)

	Total	Car	PT	Active
1970s	14	4(29)	8(57)	2(14)
1980s	10	1(10)	6(60)	3(30)
1990s	11	-	9(73)	2(27)

Figure 5. 11: Generalised scripts for alt – default respondents at *moving to current job*

As with the previous key event, the difference in travel scripts between car - default and alt - default respondents is very clear at this stage. The Structuration theory concepts illustrated at this event such as the knowledgeability factors that enable and constrain the exercise of agency, and the reflexivity of structure and agency are also similar to *moving to current home*. Respondents in the car- default group accentuate the public transport configuration constraints and therefore reinforce the travel script leading to regular commute by car. For alt - default respondents, their choice of residence and strong environmental beliefs help to create a mental structure where the situational factors of availability of public transport and active travel routes are accentuated as enablers for an alternative modes commute.

5.8 Conclusion

This chapter presented a comparative discussion of the knowledgeability factors that make up the generalised travel scripts for car - default and alt - default respondents at different key events. Four constraints were noted in the narratives, and therefore assumed to be accentuated in the travel scripts: financial; social; infrastructure; or proximity. The infrastructure constraint could be in relation to infrastructure for cars such as parking space; for public transport such as the availability, reliability and configuration of buses or trains; or for active travel such as cycle paths. Different constraints influenced the generalised travel scripts to different degrees at different key events. In brief:

- Financial and proximity constraints influenced the generalised scripts at the earlier events in the life course, that is, at *further education* and *first job*. The influence of the financial constraints seemed to be magnified at these key events.
- Infrastructure constraints especially against public transport are mentioned at every key event, mostly by car - default respondents. Alt - default respondents mostly mention these constraints at the earlier events of *further education* and *first job*. The influence of infrastructure constraints seems to be magnified at the later events of *moving to current home* and *job*, but only for travel scripts of car - default respondents for all cohorts and the 1990s alt - default respondents. It is unsurprising that it is at these key events that the influence of infrastructure constraints is emphasised as they are location related events, at the mercy of the infrastructure in those locations.
- Having children emphasised the influence of social constraints over other constraints on the travel scripts. The 1990s cohort mentions social constraints also at *moving to current home* and *moving to current job*. It is possible that being younger, they are still undergoing a life stage prone to these constraints whether in terms of children's activities or leisure activities.

The enablers were in general the same for each key event. Enablers for different modes could be seen as related to infrastructure or financial. For the car, financial reasons played a role in enabling its acquisition and running. The availability of infrastructure such as free parking at the Heriot-Watt campus seems to reinforce the decision to commute by car. Commuting by public transport is enabled mostly by the availability of a direct transport route at every key event. The enabler for active travel at the earlier

events of *further education* and *first job* is predominantly close proximity. At the later events like *starting a family*, *moving to current home or job*, an active commute seems to be a deliberate decision arising out of and perpetuated by strong personal beliefs or attitudes on health and the environment, and enabled by available infrastructure.

With regard to Structuration theory concepts, this chapter mainly illustrates: that knowledgeability factors make up the mental structure surrounding a commuting decision and are both enabling and constraining; that these knowledgeability factors are indeed a set of rules and resources in memory; that agency is indeed exercised through reflexive monitoring and rationalisation of knowledgeability factors; and that there is a reflexive relationship between structure and agency. Even though the financial, infrastructure, social and proximity factors are objective factors outside of the individual, they are also knowledgeability factors that are assimilated and accommodated into the travel scripts or mental structures of individuals at different life cycle events. Because they are continuously evaluated as enabling or constraining commuting behaviour, it can be argued that they form a set of rules and resources in memory. The mental structure or travel script can therefore be conceptualised to be a rules - resources set, as suggested by Giddens' Structuration theory.

At each life cycle event, the exercise of agency by individuals is illustrated by the re-evaluation, through reflexive monitoring and rationalisation, of the knowledgeability factors, leading to changes in or reinforcement of the travel script engaged. This also illustrates the reflexivity of structure and agency: the knowledgeability factors that form the mental structure or travel script both enable and constrain the commute behaviour chosen; in turn, the reflexive monitoring and rationalisation of this behaviour and the changing situation reinforces or changes the mental structure.

Having discussed the constraints and enablers for the commute at different key events, the next chapter will consider when these factors might contribute to a long term change in commute mode. In other words, what are the possible turning points along collective life course trajectories? Chapter Eight will then incorporate the knowledgeability factors and the scripts they influence within the collective trajectories discussed in Chapter Six and the latent motivational factors further influencing the script - discussed in Chapter Seven, to give a fuller understanding of the construction and engagement of a hypothetical travel script along various collective trajectories.

Chapter 6: Collective Trajectories

6.1 Introduction

This chapter considers the sequence of mode related and life cycle events for each collective trajectory. The discussion for each trajectory presents an illustration of the sequence of events for the collective trajectory as well as two sub-trajectories within it. The discussion aims at answering Objective Two - *How the travel script is engaged at turning points along individuals' mobility biographies*. A turning point is a lasting change in the commute mode along the commuting trajectory. In particular, this chapter answers research questions (*a)* and (*b)* under this objective by looking at:

a) **The Turning points for each collective trajectory.**

   The travel knowledgeability as previously noted constitutes the key events and the situational factors bounded by them. In Chapter Four, it was noted that the mode related events (*acquiring a driving licence, start of regular car commute, break from regular car commute and resuming of a regular car commute*) occur in chronological order while the life cycle events' occurrence varies. *Further education* and the *start of the first job* as expected are earlier. *Moving to the current home* and *job* are in general the latter events. *Starting a family or having children* generally occurs midway between the earlier and later events. The range of years within which these events occur is likely to overlap. In that instance, there would be a synergy of influence between the knowledgeability factors at the overlapping events, which would affect the construction and engagement of a travel script at that time. This collective influence of different knowledgeability factors could be a catalyst for change along the commuting trajectory.

b) **The perception of knowledgeability factors in the travel scripts surrounding the turning points; and how this affects the judgement of mental effort.**

   With the progress of a life course, there is an evaluation process which could be said to include reflexive monitoring and rationalisation, not only of the knowledgeability factors, but also, of the behaviour - the script engaged. This creates certain beliefs or attitudes or internal states about the knowledgeability factors and the commute itself. This would affect the engagement of the travel script at later stages of a life course when there are situational changes.

Due to the myriad of knowledgeability factors, evaluating them and the commute would require an amount of mental effort. As noted in Chapter Three's discussion on habits, the mental effort expended is expected to ease for all trajectories as the script is repeatedly chosen over time. Nevertheless, turning points present the initial situations when mental effort, through reflexive monitoring and rationalisation, is expended to engage a script that would satisfy a particular commute goal. The mental effort needed to engage the script is considered as part of the evaluation process an individual uses to ascribe meaning to the commuting behaviour. The assumption of mental effort economised or otherwise was based on the reasons given for the change or continued engagement of the script. Mental effort is assumed to be economised in two instances:

i. Where the reasons given are in line with the knowledgeability factors at that point in time and no effort seems to have been made to go against the sway of the constraints or enablers.
ii. Where the respondents allude to the bother or hassle involved in trying a different available mode; in other words, they found their current mode more convenient.

Judgement of mental effort is assumed to go beyond economising mental effort where the respondents engage a script for a particular mode, despite the greater convenience associated with the use of a different mode. For example, a number of respondents noted that it might be more convenient for them if they commuted by car but still chose to use alternative modes.

By placing the life cycle key events discussed in the previous chapter along a life course, and splitting the car and alt - default categories along the cohorts, 6 collective trajectories or life courses emerge: 3 car - default life courses and 3 alt - default life courses. Box plots are used to visually illustrate the occurrence of the events and allow big overlaps to quickly be identified. The over laps especially between life cycle and mode related events are investigated further as possible turning points. The perception of the knowledgeability factors at these events, discussed in Chapter Five can be identified from the narratives as possible catalysts for the change in mode. In addition, the narratives also offer insights into the mental effort applied in bringing about and sustaining the changes in the commuting trajectories.

6.2 1970s Car - default Life Course

In this life course, the majority of respondents (almost 70%) never stopped their car commute once it began. The remaining had a break from the car in the period between 1991 and 1996. From about 1993 to 2004, they had resorted to commuting by car again. This minority does not include the women who stopped work completely for 4 or more years after the birth of their first child. This exclusion is because the discussion in this chapter is particularly considering a change in commute mode rather than a complete halt of the commute.

Figure 6.1 shows that the period within which a commute by car was begun coincides with having the first child. For those who have consistently commuted by car, the start of regular car use also coincides with moving to their current home. The generalised script at *starting a family* for the 1970s car - default group (in Chapter Five) shows that almost as many people commuted by car as by public transport. At this event in particular, the box plot denotes the time period in which the first child in the family was born, but the social constraints arising from this event could be felt even 10 years later. The fact that the box plot for the *start of car use* extends a little further than *starting a family* is therefore in line with the time when the children would be in primary school; a time that most respondents reported experiencing the time constraints discussed in Chapter Five. Majority reportedly overcame this constraint by commuting by car.

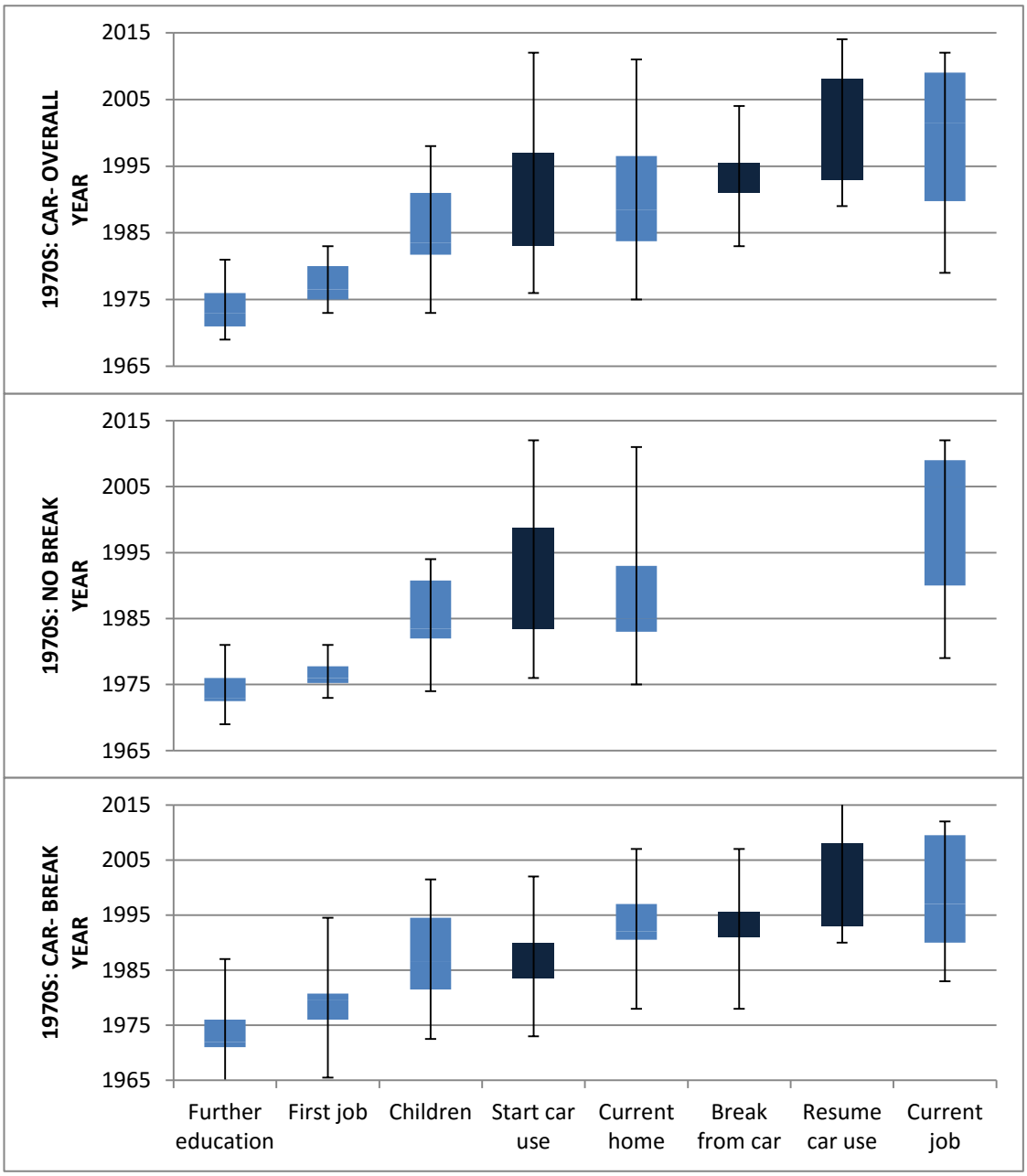


Figure 6. 1: Occurrence of key events along collective life course for 1970s car - default respondents

Starting a family is therefore a plausible turning point for this life course. The knowledgeability factors influencing the generalised script at this event can be seen as possible catalysts for the shift towards a commute by car occurred between 1984 and 1999. This proposition is supported by the fact that the timing of *starting a family* coincides with moving to the current home, especially for respondents who never stopped the car commute. The previous paragraph notes that, at *starting a family*, almost an equal number commuted by car as by public transport. Furthermore, from Chapter Five, we see that the generalised script at the time of *moving to the current home* shows that the majority were then commuting by car. It can therefore be surmised that even

though some people did not start commuting by car at the time immediately following having the first child, a short period later, they did start using the car to commute.

> "… well, when my children were at nursery, I would most often walk them to nursery if I wasn't working and if I was working, they had a child minder or a nanny who was local so I wasn't really dropping my children off so much at nursery … whereas once my children started school, you were dropping them off, using after school clubs, picking them up …, times were much more rigid and to get from the North side of town which is where I worked at the time over to get children either from a school or an after school club, it was much easier to have a car than it would have been to do with public transport. Plus you had all the stuff you carried to work plus all the stuff your kids carried to school you know." R78, 56 year old mother of 2

R78 confirms the fact that the social constraints arising out of having a child would still be felt some years later especially in primary school. The main turning point in this life course is therefore *starting a family* which is seen to motivate a car commute. Knowledgeability factors surrounding *moving to the current home* and *the current job*, such as public transport constraints, most likely reinforced the decision to start commuting by car. Another reinforcing factor worth mentioning is the wider macro-external environment. In Chapter Two, the 1980s and 1990s are noted as eras where transportation policy highly favoured the car over other modes. Although not mentioned by any of the respondents, this could have been a contributing factor.

A sub group in this life course broke from regular car use for a few years before returning to it. The start of a regular car commute for this sub group occurs generally earlier than the rest and does not coincide with *moving to the current home*. The fact that the box plot for *starting a family* extends further upwards than the *start of car use*, suggests that some respondents might have started commuting by car before they had their first child. Only 2 of these respondents noted the time pressures faced due to the introduction of children as the reason for their starting to commute by car. The rest started commuting by car to access residences that were on the periphery of the cities they worked in, while for others, it was just that the car was available.

The box plots show that the break from regular car use which occurred, for most, from 1991 to 1995, coincided with *moving to the current home* while *resuming the car commute* coincided more with *moving to the current job* than *moving to the current*

home. The fact that *breaking from regular car use* coincides with *moving to the current home* seems to be just that - a coincidence. Only 2 of these respondents moved to their current homes around the same time that they broke from the car commute. Social constraints related to their partners needing the car were the main reason for their alternative modes commute at the time. The location of their homes - near a public transport route or close to the work place - enabled this commute. For the rest, the break from the car was because of a move to a residence (not the current) or work place that allowed an easy commute by public transport. An exception to all these was one respondent who simply wanted to try out a long cycling commute for a year.

That the box plots for *resuming car use* and *moving to the current job* coincide is however not just a coincidence. The shift back to the car commute is related to moving to the current job. It can be seen from the reasons for the break from the car that convenience of the public transport to their work place played a big role in allowing their switch. Most of them worked in city centres that were accessible by buses, even though they lived at the periphery themselves. Having to commute to Heriot-Watt, also at the periphery therefore took that convenience from them and they resorted to the car. *Moving to the current job* can also be considered as a turning point in the commute biography for this life course. The knowledgeability factors in the travel script at this event seem to be catalysts for the resumption of a regular car commute, as R26, 60 year old male illustrates:

> "I didn't really needed a car particularly and then when we (Heriot-Watt) came out here that's when I really started using the car, I became a majority car user… it was entirely because of the university."

Most respondents in this trajectory seem to have been swayed by their situation. It is therefore assumed that their commute decisions at the time of starting a family was influenced by their tendency to economise mental effort in evaluating the knowledgeability factors. Where the situation allowed, alternative modes were used to commute; if not, the car would be used.

6.3 1980s Car - default Life Course

64% of respondents along this life course have consistently commuted by car from the moment they started. The rest broke from the car briefly then resumed. In general the start of car use has no remarkable overlaps with any other life cycle event. From

Chapter Five, we know that while only about a fifth of respondents along this life course drove to work at the start of their first job, the vast majority (over 90%) drove to work at the time of starting a family. This shift to a regular car commute occurs in the 10 year period between these two life cycle events, as figure 6.2 shows. This suggests that the start of a regular car commute is influenced by what happened in that period. This period, for most people, was characterised by promotions or changes in jobs and residences, and moving in with a partner among other life events.

> "I started work and I lived in one town and worked in another town about 7 miles away and I cycled to work. And then got a somewhat better paying job and I bought myself a car, and then it was a mix of cycling and driving to work, … I then moved from that job and moved houses again. I'd moved houses a few times in this period of time…" R47, 49 year old father of 1

The first discernible turning point for this life course is the start and progress of a career which catalyses the start of a car commute between 1989 and 2000. The knowledgeability factors at the later 3 life cycle events - *starting a family*, *moving to current home* and *moving to current job* - would therefore reinforce this car commuting habit. The other changes in the mobility biography seem to be a matter of the most convenient option, as will be elaborated upon shortly.

For the 36% who broke from a regular car commute, the start of a car commute overlaps significantly with the start of their first job. Just over half of them had a car when they were at university although they did not use it to commute and the rest started a regular car commute within about 2 years of the first job. Their break from a regular car commute occurs a few years after its start. From figure 6.2, this is in the 9 years between the *start of the first job* and *starting a family, moving to the current home* or *job*. Their narratives provide further insights into the reasons for this break. They show that while events surrounding the start of a career led to the start of a regular car commute, the progress of that career was responsible for the break in the regular car commute, just like the 64% majority. But unlike the 64% majority, the circumstances surrounding the career progress also enabled a commute by alternative modes for a brief period. Proximity enabled walking or cycling, while public transport was enabled by its availability.

> "…when I worked in Edinburgh city centre; I got the train, so I used to drive to the local train station here and take the train into town and then walk. So I did

that and other jobs where I have driven its where there has not been a direct bus or train ride so driving was the easiest option" R44, 44 year old mother of 2

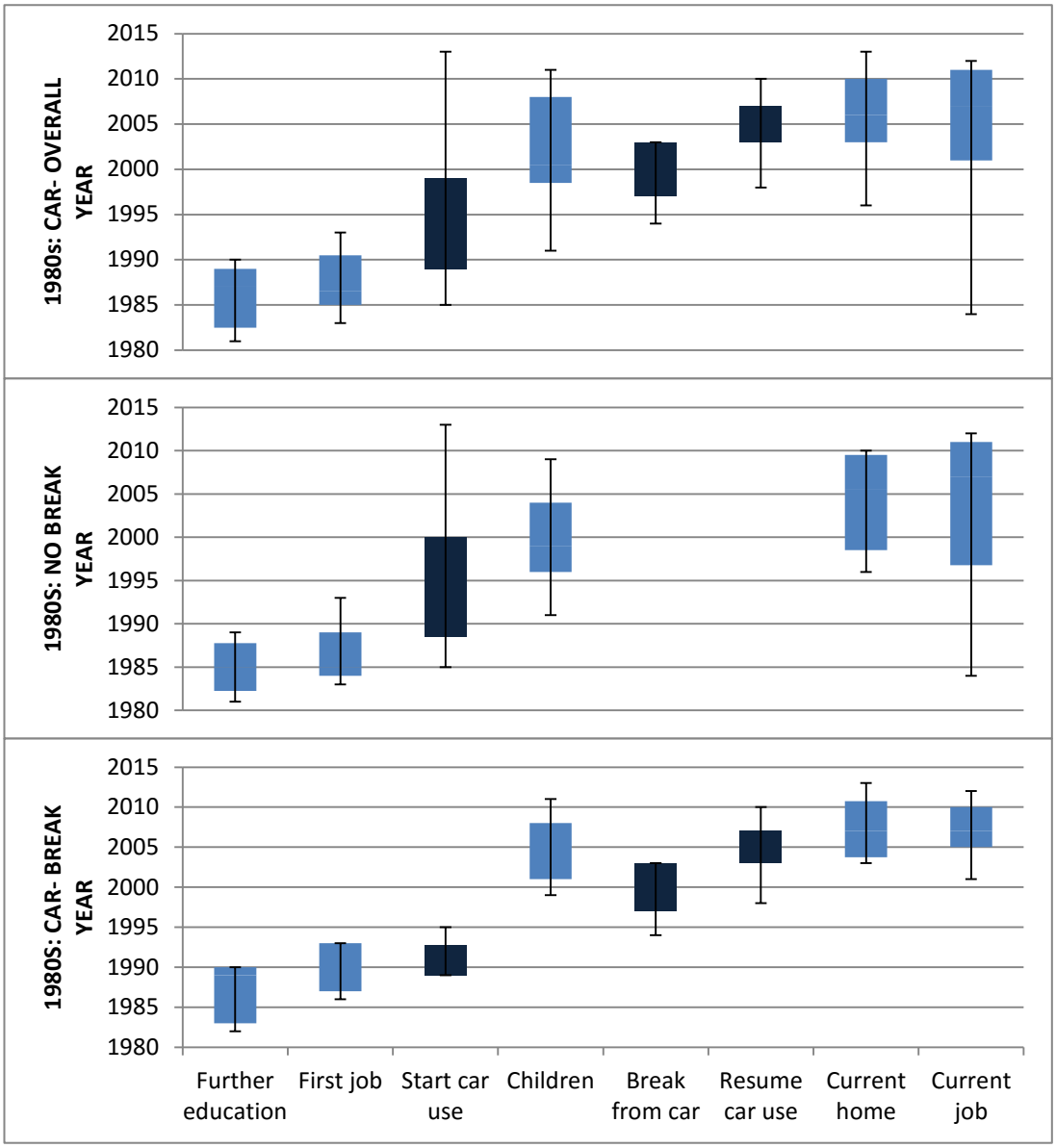


Figure 6. 2: Occurrence of key events along collective life course for 1980s car - default respondents

Resuming the car commute occurred from about 2003 to 2006 and overlaps with *starting a family*, *moving to the current home* and *moving to the current job*. The knowledgeability factors expressed in all 3 events might therefore have influenced the mode switch. The narratives support this inferred implication of the overlaps: 2 respondents noted the need to do a school run as a reason for commuting by car; others reported moving to their current home which was further from their work place; while

one noted the move of the workplace to the Heriot-Watt Campus on the outskirts of Edinburgh as the main reason for going back to the car. It should be noted that the *start of a family*, *moving to the current home* or *the current job* overlap with each other and so the constraints arising from the location related events maybe reinforcing each other and those from the *start of a family*. Those who reported the need to do a school run, for example, were to a significant extent also constrained by the location of their current homes in relation to their current work place.

The commute decisions made by respondents in the 1980s car - default category along their life course also seem to mainly be based on the easiest thing to do, given the situational factors faced. Minimum mental effort in evaluating knowledgeability factors at the turning points is therefore assumed for this group as well.

6.4 1990s Car - default Life Course

As with the car - default life courses of the previous cohorts, majority of respondents along this life course (9 out of 11 people) never stopped once they started commuting by car. Only 2 stopped and later resumed. The start of a car commute overlaps in part with the *start of the first job* and extends a further 4 years, as figure 6.3 shows. The period within which a commute by car was started spans 9 years from 1998 to 2007. Like the 1970s and 1980s cohorts, this is a period of career progress. It is stated in Chapter Five that a number of these respondents, enabled by improving finances at their first job bought and started commuting by car. Unlike the 1970s and 1980s cohorts, proximity and infrastructure enablers have not motivated a commute by alternative modes. Almost half of these respondents do not yet have children and live in proximity of direct public transport routes. For those with children, while their current commute is heavily influenced by the time constraints related to children's activities, the start of the regular car commute was 4 to 10 years before the start of a family. The rest attribute their preference for the car commute to time pressures at work and the need to get to recreational activities after work. Others have simply gotten used to the car and become complacent.

It is important to note that these respondents are younger and have therefore - by the time of the interviews - had less opportunity than the other cohorts to break from a regular car commute. Nevertheless, analysis of the transcripts of the 2 respondents that broke from a regular car commute and resumed after a few years shows that the use of the car to commute is directly related to their choice to live in areas where there are no

direct public transport routes to the work place. Resuming the regular car commute coincides with the period within which they moved to their current job or home.

For respondents that followed this life course, the start and progress of the career seems to be a significant turning point, swaying many towards a regular car commute. Moving to the current job and home are more of reinforcers than catalysts. As with the other car - default life courses, the 1990s cohort's commuting decisions seem to be influenced by the situational factors faced. A tendency to minimise mental effort in evaluating knowledgeability factors at the start of their career is therefore assumed.

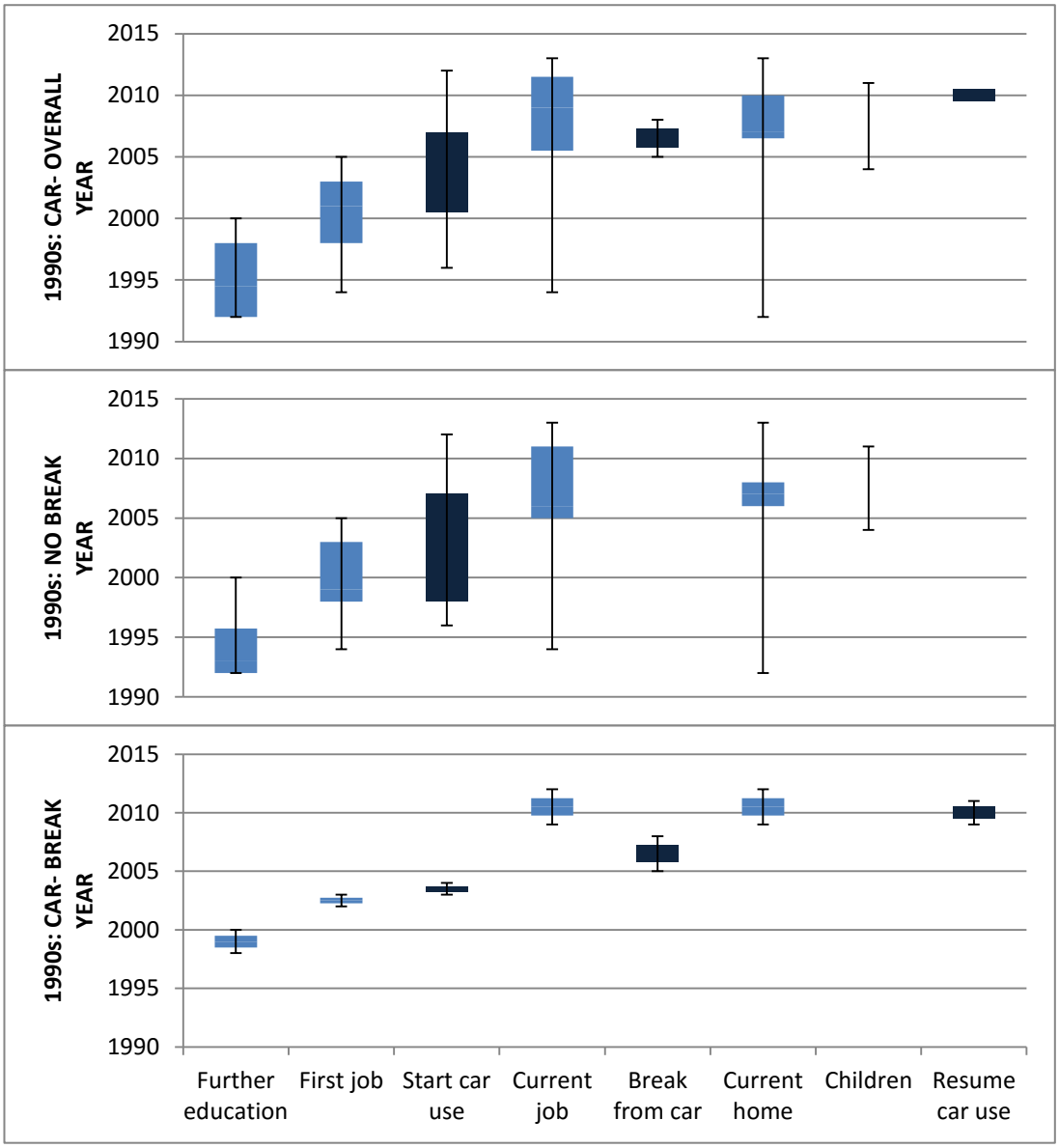


Figure 6. 3: Occurrence of key events along collective life course for 1990s car - default respondents

6.5 1970s Alt - default Life Course

For respondents that followed this life course: 4 have never had a regular commute by car; 1 has been a daily car sharer as a driver for a number of years now. The remaining 9 (64%) started regular car use but broke from it and now commute by alternative modes. There are no remarkable differences between the occurrence of events for the entire group and for those who once commuted by car. This is because those who once commuted by car are the majority and therefore skew the graph.

Figure 6.4 shows that, like the 1970s car - default group, the start of regular car use overlapped with having children. The generalised script from Chapter Five shows that a few people had started a regular car commute at the time of their first job, enabled mostly by the availability of a company car. This explains the small overlap between *first job* and *start of car* in figure 6.4. The generalised script for *starting a family* does show a slight majority of people commuting by car at this stage. It is the only generalised script for the 1970s alt - default group where commuting by car is by a majority. At this point in the life course, the trend is similar to the 1970s car - default life course.

From about 1999 to 2005, respondents who for about the previous 10 years drove, broke from a regular car commute and started using alternative modes, mostly public transport. While the box plots in figure 6.4 show that breaking from regular car use overlaps with the timing of moving to the current job, the overlap is only with the upper end of moving to current job. This suggests that for a few respondents, the *break from a regular car commute* did coincide in timing with the move to the current job. For the rest, this break occurred a little later than the *move to the current job*. Analysis of their narratives makes it clear that *moving to the current job* did not influence the break from the car but might have reinforced the decision to commute by alternative modes by virtue of the location of Heriot-Watt to the current homes of some respondents. One lives close to the university campus and a few live along direct public transport lines.

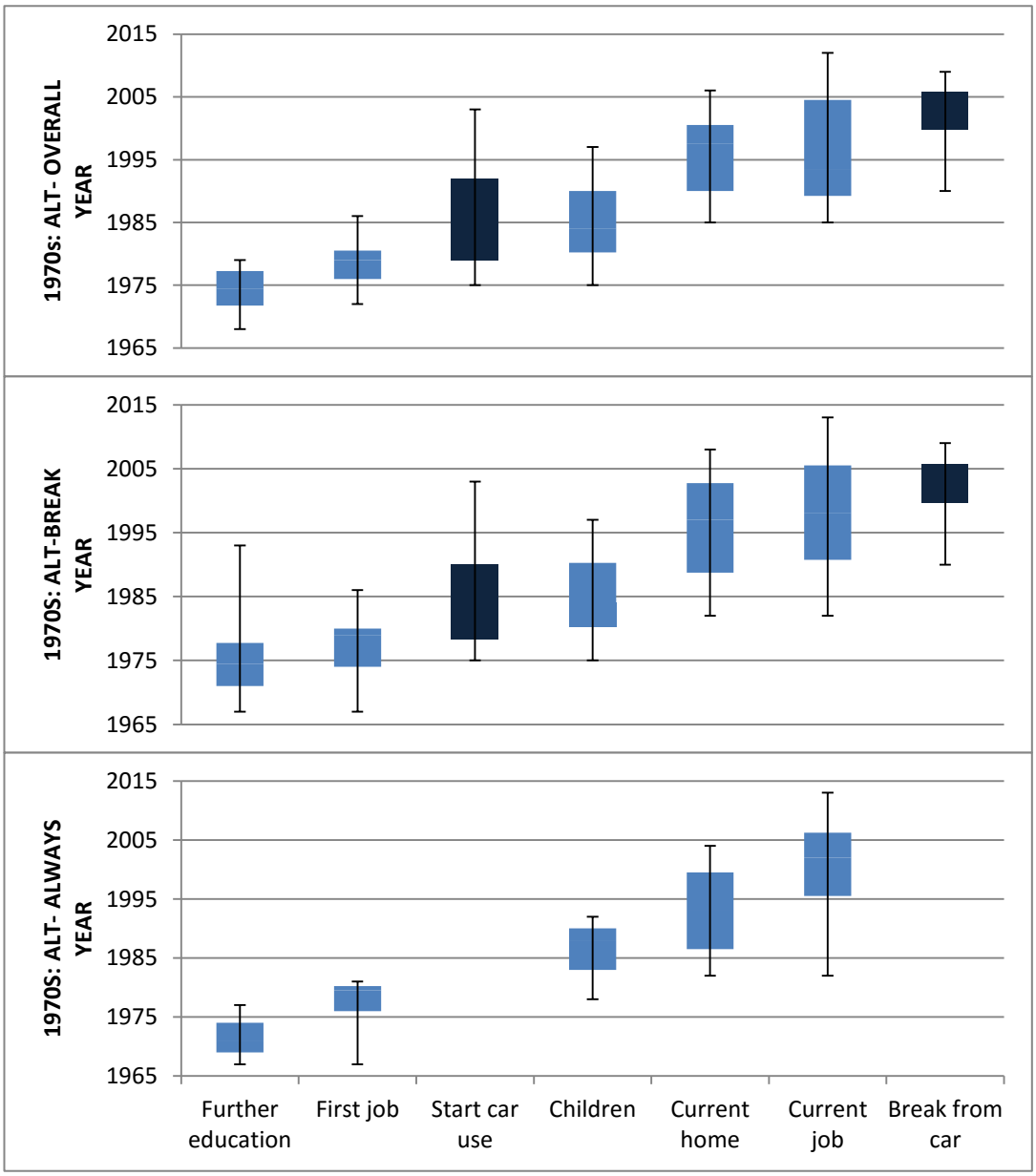


Figure 6.4: Occurrence of key events along collective life course for 1970s alt - default respondents

A more likely possibility for this break is that the constraints that motivated the start of the car commute - constraints due to children's activities - were starting to ease up. R12, 53 year old mother of 3, illustrates below:

> "I had to take the car because it just wouldn't work. I had to try to drop her off, drop the boys at school, go to work and it just would have added so much time on to the day and if I had I don't know how I could have done it… So I did that for 10 years. I suppose once the boys got older, they could walk to school, and then towards the end, I was able to walk and I would walk with (daughter) to

school and she was old enough to come up and meet me at work and we would walk home."

In addition to this, R8, 60 year old mother of 4 reveals an important influencer for the switch to alternative modes that is not related to any of the knowledgeability factors previously discussed:

> "…I think I can only do the way I do it now because my children aren't tiny and I don't feel that I have to rush back at the end of the day. I used to feel, I must get back quickly and now it doesn't really matter I can sit on the bus and read a book or whatever but you know but that would have been I think harder years ago, although one could do it but you'd have to build in an extra little thing in your system to make you value not having a car."

It is important to note that half of these respondents do not live along direct public transport lines. This *"extra little thing in your system"* points to certain self - motivational processes, or internal states that are exhibited by most of these respondents. It points to an internal or mental effort, different from the tendency to minimise effort exhibited by the previously discussed life courses, that influenced the change in the travel script engaged.

As far as when the life cycle events occurred, there is also no remarkable difference between those who once commuted by car and those who have never had a regular car commute. The narratives of those who have never commuted regularly by car reveal similar self - motivational processes behind their choice to stick with alternative modes, as will be elaborated in Chapter Seven.

6.6 1980s Alt - default Life Course

Of the respondents that followed this life course, 4 have never had a regular car commute. 6 out of 10 started a regular car commute but shifted later to alternative modes. Figure 6.5 shows that there are no major differences between the occurrence of the events for all the respondents and for those who started a regular car commute. Like the 1970s alt - default life course, this is because the 60% majority skew the graph.

Although the *start of regular car* use coincides with the *start of the first job*, few respondents noted the poor public transport at the time of their first job as a reason for starting to use the car. Half of the respondents acquired cars while at university and so

continued with that. Further analysis of their narratives reveals that, as they progressed in this life course, all except one broke from the car at the first opportunity because of personal beliefs.

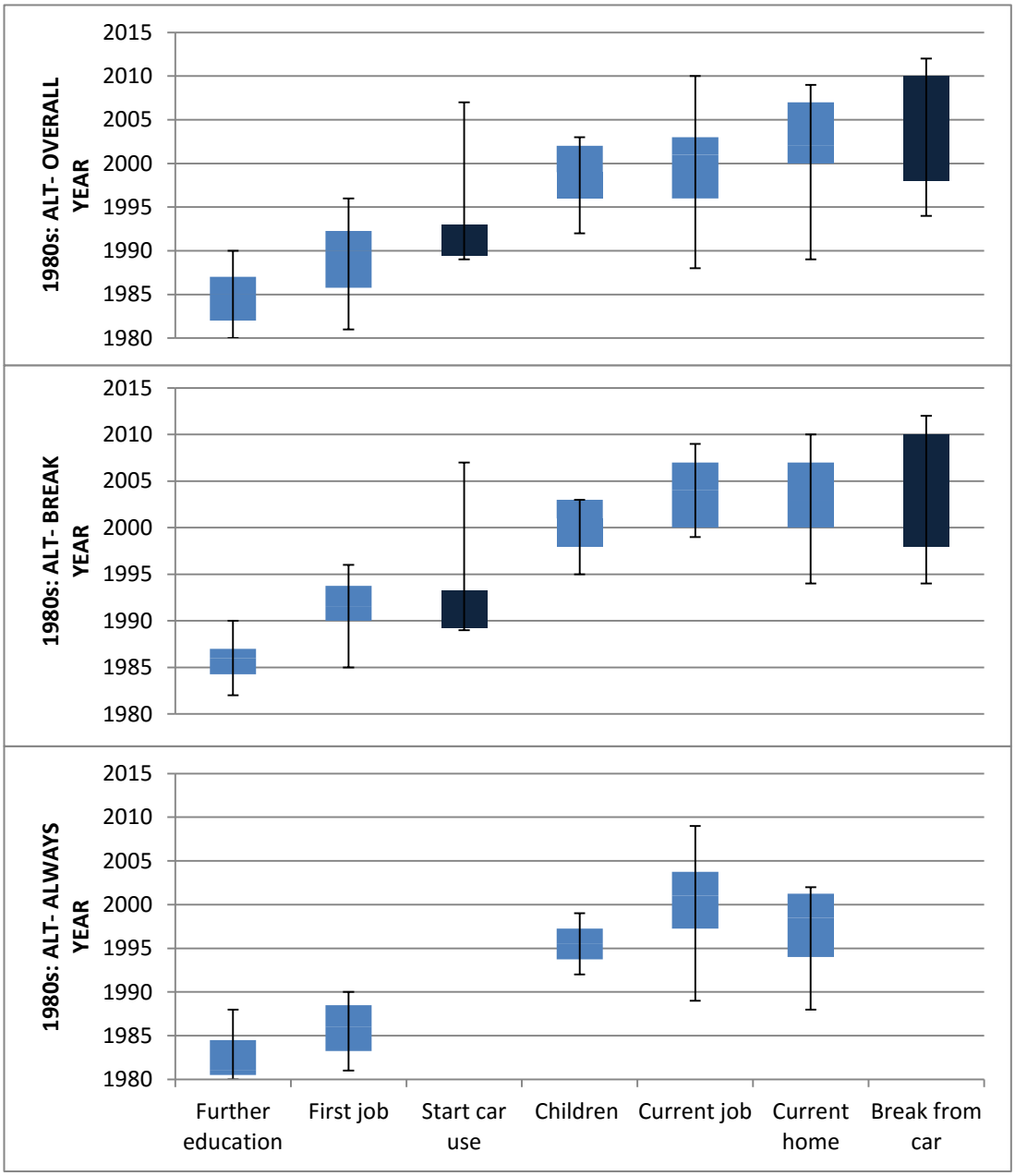


Figure 6.5: Occurrence of key events along collective life courses for 1980s alt - default respondents

The break from the regular car use coincides with *starting a family*, *moving to the current home* and *moving to the current job*. *Current job* and *current home* for this life course occur at about the same time, while *starting a family* is in general about 2 to 3 years earlier. This is significant in light of the discussion in Chapter Five which notes

that many of these respondents situated themselves in areas where a direct public transport route or active travel infrastructure was available between their homes and the work place. This further demonstrated the personal resolve exhibited by these respondents to enable their break from a regular car commute. R29, 50 year old father of 3 illustrates:

> "It was a nicer area to live. It was where I wanted to live and it wasn't too bad for getting out here. All of the times I've looked for somewhere to live, I've wanted to make sure that I wouldn't be forced into driving, I mean I really like where I live, but it was only 2 or 3 places we looked because we wanted somewhere with a garden for the children and I wanted to be able to not have to drive so anywhere that's out round the bypass where you have to use the bypass was no good."

While knowledgeability factors surrounding *moving to the current home* or *job* contribute to the break from a regular car commute, the transcripts reveal that many of these respondents, like the previous cohort, are motivated by an *"extra little thing in their system",* as R29 again illustrates:

> "when I first started work out here I did sometimes drive and then I would drive (when) I thought it was going to be too windy or too rainy but I realised too often, it's too windy or too rainy and actually if you just get on with it, its fine, so I just made the decision"

These self - motivational processes, shared with the 1980s alt - default respondents who have never had a regular car commute, are important for this life course as they seem to influence the decisions regarding the location of the current home which in turn enables the commute by alternative modes.

6.7 1990s Alt - default Life Course

Almost half (45%) of respondents following this life course have never had a regular car commute. The remaining 55% started a regular car commute but broke from it. The *start of regular car use* coincides partly with the *start of the first job.* It can be inferred from figure 6.6 that because the occurrence of the *start of regular car* use extends further than the *start of the first job*, some people began a regular commute as their career progressed rather than immediately after the start of the first job. The narratives confirm that for the majority, as they changed residences to access different jobs, they

faced an inadequate public transport system which contributed to their switch to a car commute:

> "I did have a car because of where I lived, so there wasn't a convenient bus, I was living further away from where I was working so I had a car and I drove to work" R52, 39 year old mother of 2.

For a few others, the use of the car was merely because it was available and convenient:

> "in fact I did work at Heriot-Watt before when- this was just after my first degree … I got a temping job in the estates and buildings here, just a few months and I always drove, always and it never crossed my mind that I should get a bike, I just thought it's far away and I'll drive, that's obvious" R38, 38 year old mother of 2

Because this life course is shorter in duration than the 1970s and 1980s life courses, only 3 out of 11 have children. For these respondents, *starting a family* does not seem to influence the commute mode. The break from the car overlaps with both *moving to the current job* and *current home*. The transcripts reveal some of the motivations behind the choice of current residence:

> "We bought a flat in Broughton Street just because we liked the flat, we didn't know much about the area, but then we just really liked it. When we bought our next flat, we bought it in the same area because we didn't want to move, it's a nice area and it's really central ... I certainly wouldn't move to be closer to Heriot-Watt" R38, 38 year old mother of 2

> "we did pick it for its location I suppose because we just saw on a map that it was good beneficial location but I didn't have a job here at Heriot-Watt I worked somewhere else so it wasn't like I specifically chose that area that was handy for my work, we just saw that it was central so we thought it must be handy" R77, 32 year old married woman

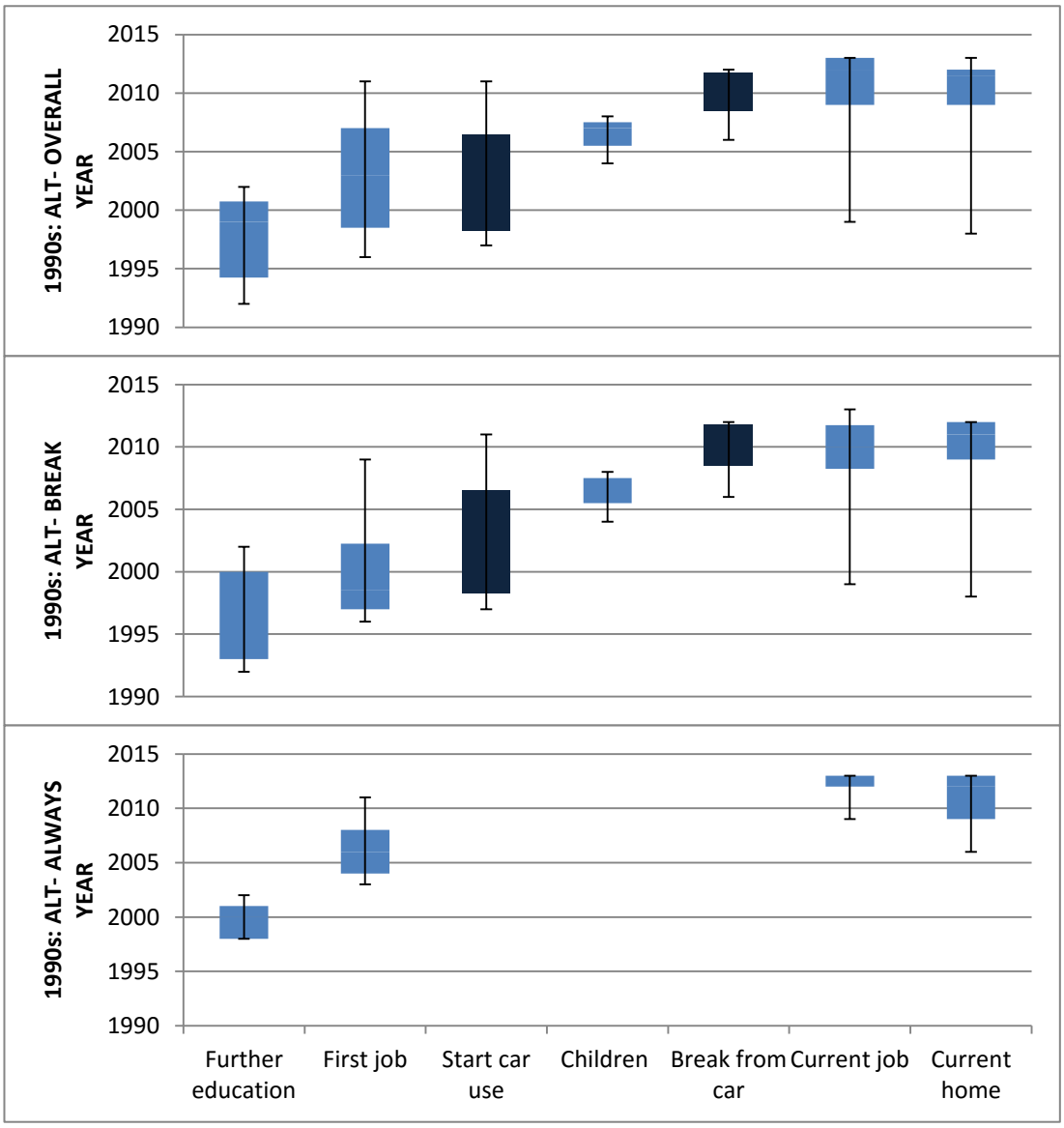


Figure 6.6: Occurrence of key events along collective life course for 1990s alt - default respondents

The majority of the other respondents expressed similar sentiments noting that their choice of current home was mainly because of the centrality of the location. This centrality happens to have good public transport routes and some cycle routes to the Heriot-Watt campus and this enables the alternative modes commute. Unlike the previous cohorts, the *"extra little thing in one's system"* is only reported by 4 out of 11 respondents. For most respondents in this life course, even those who have never had a regular car commute, lifestyle preferences seem to have influenced the mobility biography so far. The fact that their commute decisions seem to be swayed by convenience is the basis for the assumption of the tendency to minimise mental effort for this alt - default life course.

6.8 Conclusion

This chapter situated life cycle key events along the different car - default and alt - default collective life courses. Some overlaps between these events and the mode related events revealed possible turning points that orient the mobility biography towards a regular car or alternative modes commute. These are summarised below:

- **Starting a family:** This was a turning point for both 1970s car - default and alt - default life courses. The narratives also reveal that the easing up of constraints associated with this key event contributed to the break from a regular car commute by the 1970s alt - default respondents.
- **Start of first job and progress of career:** This was noted as a turning point for the 1980s and 1990s car - default, influencing the start of a regular car commute; and 1990s alt - default life courses, influencing a commute by alternative modes. Career progress was noted as associated with various residential moves which sometimes also led to the break from regular car use when public transport was available or when it was considered close enough to walk or cycle.
- **Moving to the current job:** This was a turning point for the 1970s car - default life course. It seemed to influence those who had broken from a regular car commute to resume it.
- **Moving to the current home:** This event seemed to have a secondary rather than primary influence at the turning points. Together with the *start of a family* and *moving to the current job*, they seemed to influence the resuming of a regular car commute for the 1980s car - default life course. It is likely that factors associated with this event were more of reinforcing factors for the decision already taken than catalysts for change.

The discussion on the perception of knowledgeability factors at the turning points distinguishes two groups. One whereby only the evaluation of the knowledgeability factors significantly influences the engagement of the travel script; the other whereby, the travel script engagement is influenced more by personal resolve termed as "*an extra little thing in the system*" by one respondent, rather than by the evaluation of the knowledgeability factors only. The knowledgeability factors associated with events at the turning points were identified from the narratives as the main reasons behind the turning points for the car - default life courses and the 1990s alt - default life course. It

was therefore assumed that the respondents in these life courses exhibited a tendency towards economising mental effort in the evaluation of these factors.

For the 1970s and 1980s alt - default life courses, the overlaps between the life cycle and mode related events led to a change in their commuting trajectories but not a lasting one. The start of a family, for example, had most 1970s alt - default respondents opting for the car but later went back to using public transport, cycling or walking. These respondents seemed to dig deeper and beyond the economisation of effort. They attributed their break from a regular car commute to the *"extra little thing in the system"*. This resolve was shared by most of the respondents who never even started a regular car commute.

These different judgements of the mental effort manifest the underlying psychological process of evaluation in which individuals give meaning to their commuting behaviour, in line with perceived self - identity. This difference in judgement of effort also suggests that individuals, not only exercise their agency through reflexive monitoring of the knowledgeability factors, but also through motivation. In Chapter One, the discussion on the elements of Structuration theory - in particular, agency - noted that motivation relates to the conscious or unconscious wants or preferences that prompt action. This judgement of effort, whether to economise it or dig deeper to override the situational constraints, is separate from the knowledgeability factors, but also prompts action. It is reasonable to assume that it is rooted in an underlying factor such as self - identity.

By using this difference in the judgement of mental effort as a segmentation criterion, Chapter Seven will consider how it underlies the accentuating and downplaying of needs, preferences and interests to satisfy commute goals, in a way that is in line with the corresponding identity group.

Chapter 7: Economy of Effort versus "An Extra Little Thing in the System"

7.1 Introduction

This chapter uses the identity segmentation criterion of judgement of mental effort at the turning points - identified in Chapter Six - to show the different meanings associated with the commute goals which one strives to satisfy in line with a perceived self - identity. It answers the third research question underlying Objective Two, that is, *how the evaluation of mental effort validates certain identities*. In particular, the following are considered:

i. The commute goal related to each identity group
ii. The needs, interests or preferences accentuated or downplayed for each identity segment to filter out different meanings for these goals
iii. The coping strategies employed when a desired state of identity, satisfied and expressed by a particular travel script, is threatened

The different meanings ascribed by the different identity groups are illustrated by the different perceptions of the same commute goal - the desired result of the commute. Needs, interests and preferences are accentuated or downplayed to filter out meanings for the commute goals that are in line with an individual's perception of their self - identity. The difference in the judgement of mental effort discussed in Chapter Six highlights a component of the desirable states of identity that are aspired to. This chapter complements Chapter Six in illustrating the exercise of agency through the underlying identities that motivate behaviour. Drawing on the Identity Process theory, it is proposed that the underlying identity motivates action through certain principles that determine the desired state for the structure of identity.

This chapter presents another facet of the evaluation process by focussing on self - efficacy as one of the principles proposed by Identity Process Theory that determine the desirable state for the structure of identity. One of the tenets of Identity Process Theory regards the reaction to threat against the desired state of self - identity, that is, coping strategies. As noted in Chapter One, the focus of the desired state of identity for this research is based on the self - efficacy principle. Murtagh et al. (2012a) state that circumstances which threaten the principles under which the self operates will trigger coping strategies such as deflection strategies that involve: reconstruction of meaning;

denial of the existence of the threat; negativism or confrontation of the threat. Other coping strategies are acceptance strategies which include compromise changes and fundamental changes among others. Apart from presenting the factors accentuated or downplayed with regard to a particular commute goal, coping strategies to deal with perceived threats against the self - efficacy to commute in the desired way will also be presented.

Chapter Six singled out the identity group which exhibited an "extra little thing in the system" and one where the respondents were assumed to exhibit an economy of effort. Since the tables were generated according to default mode and cohorts, the perception of goals and coping mechanisms expressed by the 1970s, 1980s and 1990s car - default and 1990s alt - default respondents were discussed under economy of effort. Those expressed by the 1970s and 1980s alt - default respondents were discussed under the "extra little thing in the system" as the following discussions will show. For an easier structure to the discussion, the goals are grouped into three categories: cost effectiveness, timeliness and control, and comfort, based on their relatedness. For example, timeliness is considered together with control as many of the perceptions of time related to respondents desire to control the way they spent their time.

7.3 Economy of Effort

It should be noted that for a number of circumstances the car appears to be superior to alternatives modes in addressing all the goals except cost effectiveness, as R47, 49 year old father of 1, points out, regarding public transport:

> "For public transport to work for me, there are a number of factors, there's convenience[3], there's speed, there's comfort and there's cost and for me to want to use public transport over car, it's got to be equal or better in at least 3 of them. So the car is always going to be more convenient because it's door to door so it's almost never going to win on that one and the car is almost always going to be more comfortable but public transport may be cheaper and it may be quicker and sometimes can be close and convenient."

It is therefore unsurprising that all the car - default life courses exhibit this inclination to expend an economy of mental effort in the enactment of their travel scripts.

[3] Convenience is a general term used by most respondents to denote the control and/ or comfort afforded them by the car. In this case it is used in relation to being able to travel at whatever time one wanted to.

7.3.1 Cost Effectiveness: Minimal Financial Hassle

It was noted from Chapter Five that students face financial constraints in the early life cycle event of *further education,* and therefore, commuting by car was not a feasible option for most. Even those who had cars at the time they were at university did not always commute with them. For the 1970s cohort, general usage of local public transport was in decline at the time and the majority of respondents in this cohort walked to their institutions of further education. For the 1980s cohort, slightly more people commuted to university or college by bus than by active modes. From about 1980 to 1985, the general usage of local buses increased then decreased following the deregulation of buses. The usage of public transport by these respondents may therefore have been out of necessity and the fact that a direct service was available. At the same time, there was a slight increase in cycling in Britain at the time and this is reflected by more respondents of the 1980s cohort compared to the 1970s cohort cycling than walking at further education.

Despite the general trend of public transport decline, the financial constraint that characterises this stage necessitated the use of public transport for many respondents, both car and alt - default, regardless of the cohort. As careers progress along the life course, there is an increase in income and for the car - default respondents, a car is acquired, as was noted in Chapter Six for the 1980s and 1990s car - default life courses. The 1970s cohort experiences the progression of their careers in the 1980s, a time when public transport costs were rising and the quality of the service declining. In addition the cost of driving was greatly reduced. For the 1980s cohort as well, the late 1980s and early 1990s were also characterised by a reduction in the cost of cars. All these factors made it easier in terms of minimal financial hassle to commute by car than by alternative modes. This goal seems to become less influential as the life course progresses. This may be a reflection on the sample of respondents as most of them are professionals therefore, they are likely to be able to afford to run at least one car.

7.3.2 Timeliness and Control: Control of Time

Complementary to the minimal financial hassle, as the respondent's careers progressed, the car was considered as faster and offering more control than the other modes. At the start of the first job, most people experienced a switch from a variable start and end of each day of the week due to different lecture schedules, to a 7 or 8 hour day at work, 5 days a week. With the increased demand on personal time, respondents expressed

weariness with hassle associated with the commute and felt the need to have control over their time. While cycling could be argued to compete with the car in terms of door to door control of the commute, the long distances and poor cycling infrastructure involved made it difficult for many respondents to keep up their cycling commute. Time and control are considered as part of the same goal here because the respondents not only considered their travel time but more importantly, how the time of different activities could be synchronised with the duration of the commute.

Public transport was perceived to involve mental hassle in terms of the need to synchronise the end of one's work day with the bus schedule:

> "I'm not a clock watcher so quite often I tend to be sitting at my desk after 5 at night and I quite like not having the constraints of thinking oh I've got to go and catch that bus, I quite like being able to, it feels more relaxed, you don't feel so pressured and you think I can just take the time and finish this job because you know the car's there and you're not going to have to get somewhere for a certain time for the bus or whatever" R42, 55 year old mother of 1

In addition to this, the frequency of buses in Edinburgh reduces in the evening making it difficult for some to rely on the public transport if working late:

> "because of my job I tend to work odd hours and long hours and often at night when I leave, the buses here change at about 6.30 and the service after 6.30 is not quite so good and when I change buses it's not quite so good so I've been driving to and from for the last year simply for convenience" R20, 54 year old father of 2

In addition to demands on time by work, as the life courses progressed, even more constraints were introduced by other life cycle events, most notably the start of a family. For the 1970s cohort, Chapter Seven shows that for car and alt - default respondents, this key event was the turning point towards a regular commute by car. The time budget became tighter as more constraints related to the children's activities were introduced.

> "By that time as well I had young children so I had to get them to childcare or school or nursery and things and to be able to do that and get to work really meant I had to take the car so that's when I started obviously using the car all the time," R57, 48 year old mother of 3

With these added constraints, one needed to expend more mental effort and physical effort to figure out the best way to chain trips in such a way that was synchronised with the time of the different activities and the schedule of the public transport. If an individual did manage this, the commute by public transport or active modes would take longer than by car. R23, 45 year old mother of 2 illustrates:

> "Any other method for commute purposes is going to add on to my day. I mean I have a relatively short commute compared to some people and it would add on to my day if I used another method of transport and I don't see me not having a car in the future"

Apart from achieving a shorter commute, it was noted that the car allowed one to be more in control of the trip chaining, especially the ability to make up for lost time:

> "I think there's definitely a thing about control, when you're in the car you always feel you can go a little bit faster and make it whereas when you're on the bus or the train, you have to just chill and I'm not very good at that… and you always feel you're invincible and you can always make it 3 minutes quicker, you always feel that in the car you can do that, even though you never can, it always takes the same time but there's always the sort of self-belief that I've left 10 minutes late but don't worry I can make it up and you can't but you kind of convince yourself that you can." R78, 56 year old mother of 2

For those who had begun a regular car commute even before having children, such as the 1980s and 1990s cohorts, these added constraints seemed to reinforce the choice to commute by car.

As the life course progresses even further, it is noted from Chapter Six how respondents in the car - default life courses continue the car commute citing location related constraints associated with moving to the current home or current job; and how much time would be added to their commute if it was not by car. Bagley and Mokhtarian (2002, cited in Scheiner, 2007) note that spatial effects are of limited importance for travel mode choice when lifestyle and attitudes towards modes and locations are being controlled for. In the same vein, these car - default respondents, having already established a lifestyle dependent on the car, do not consider access to work by public transport or active modes in their search for an ideal family home. Due to the housing

market situation, most then end up living at the periphery of the Edinburgh urban centre, in areas where public transport to work would not be direct, therefore taking longer.

The 1990s car - default life course presents another dimension to the goal of timeliness for the travel mode. Many do not yet have children therefore the time constraints from children's activities do not concern them. They still report a constrained time budget at the back end of their commute because of the desire to access recreational activities or having to get home as quickly as possible after working extra hours in the evening.

7.3.3 Comfort: Comfortable External Environment/ Personal Space

Comfort is defined as the state of physical ease and freedom from pain or constraint. The goal of comfort was gleaned from expressions regarding the environment in the public transport vehicle and the hassle involved in the commute. Some respondents hold very strong feelings against public transport:

> "I despise public transport with a passion…I know I used to get on the bus when I was small. I don't mind coaches, I think it's buses, they're just horrible nasty smelling nasty things with lots of people that just invade my personal space it just really annoys me." R47, 49 year old father of 1

Although this respondent's comment may be considered extreme, other respondents shared similar, though not so extreme, sentiments. They expressed concerns about the environment within the public transport vehicle as unhygienic and sometimes the need to stand throughout the journey during peak times.

The goal of comfort was also expressed in the need to be free from the hassle related with the commute. The hassle was expressed in the form of the need to carry things related to work or to the children's activities; and the mental or physical effort required for an active commute. At the time of starting a family, respondents - mostly women - noted the need to carry extra things for the children and that it was easier with the car:

> "And I suppose when you have a baby, the car is the easiest way to get around. In those days you had a carry cot and bits and pieces and we didn't have the slings in those days. My daughter, you could put her on the sling and get on a bus but just seemed to be the car was the easiest thing to get around when the kids were wee and they've got their bikes and what not." R12, 53 year old mother of 3

Other respondents noted the need to carry things for work, such as, laptops or papers for grading:

> "if I've got to take my laptop and papers home then I'll drive … because it's quite a hilly route, I don't want any extra weight, laptops and all that on the bicycle," R19, 64 year old father of 2

As far as a commute by active modes was concerned, some respondents noted the desire for freedom from the hassle of having to take a shower at work after the commute; or during winter, having to put on and off several layers to ensure comfort on the bike:

> "I've always worked in office areas where you have to be so smart and I don't have easy access to changing or showering facilities so I wouldn't want to turn up to work and be a bit grubby and sweaty and have to change into work clothes. … I like to take my time and get ready at home and then come in to work and just be able to start work immediately not fuss about getting changed and so on. With the bike it would just be a bit too- I just wouldn't feel comfortable not showering at home and that kind of thing. And having your clothes not bundled up in a bag and I wouldn't want my suits crushed and looking a bit scruffy, it wouldn't be the right thing given the job I have and being smart is expected." R43, 32 year old single woman

R43 above highlights two issues that compound the hassle especially related to an active commute. For some people, personal space for carrying out personal activities like showering in very important. Just like the respondents who noted the invasion of their space by other people in the bus, the use of public showers seems to be perceived as leaving one's personal space open to encroachment. The second issue is related to the norms and expectations of the work environment. For work environments where one's personal presentation is key and an official dress code is upheld, there may be the pressure to look official at all times. The unavailability of changing facilities, compound this situation making an active commute bothersome.

For an active commute, the commute in poor weather was one comfort factor where the car had a significant edge over the bicycle or walking. Some respondents in the 1970s and 1980s cohorts who cycled in their younger days remarked that they had become fair weather cyclists in their old age and did not find it worth their while to bother themselves with the discomfort of cycling in poor weather:

> "I mean there were times when it was nice but it was just too long and I just didn't have the time, its 2 hours and you're knackered at the end … life's too short for that, so I drive." R3, 54 year old father of 2

7.3.4 Coping Efforts: Compromise changes

Almost all respondents noted their awareness of the drawbacks of regular car use in terms of the expense, possible exacerbation of a sedentary lifestyle, traffic congestion, and environmental pollution. This awareness possibly kindled cognitive dissonance which could have been perceived as a possible threat to engagement of the script to commute by car. This assumption is based on the fact that respondents seemed to be engaging some coping strategies to reduce this dissonance: denial of the expense related to car use as a threat to their identity; and coming to a compromise between competing goals.

Respondents with a tendency towards economy of effort seemed to cope with the draw backs of a regular car commute through acceptance strategies, specifically compromise changes. These are demonstrated by the trade-offs or negotiations between the threat and the desired state of identity. With regard to the encouragement of a less active lifestyle, for example, many respondents down play this fact noting that they are active during their leisure time:

> "But I like to walk, it's not like I want to use the car all the time but because of where I live, things are not on my door step… I don't want to walk half an hour down to the super market to walk back another half an hour uphill all the way with 3 or 4 bags of shopping but it's not because I don't like to walk, I do enjoy walking and I walk for leisure in the evening with friends but the car is for commute and out and about weekend, shopping and stuff" R23, 45 year old mother of 2

In addition, they accentuate the problems faced with an active commute, specifically with cycling, noting the lack of infrastructure, their own lack of fitness and the fact that with age, they are uncomfortable exerting themselves physically as they used to when they were younger:

> "(It) isn't just a road safety issue but the main reason is that I probably take an hour or so to cool down…Physically I don't think I'd be able to do it either, it's

the time it takes, it's probably a good 45-50 minute cycle ride. I've never tried it" R30, 42 year old father of 3

"I've never cycled to Heriot-Watt, I'm getting old for that so I've not really cycled to work for probably nearly 10 years…I have thought about cycling here, the university has a campaign for cycling, there's showers in the building and there's a bike doctor on site but I've never cycled here but it's because I've never done it, wouldn't know how, there is a big roundabout just at the bypass I'm not quite sure…"R20, 54 year old father of 2

With regard to traffic congestion, most respondents confront this by slightly adjusting their routine commute actions either by travelling outside peak hours or taking alternative routes. Many expressed confidence in their knowledge of the city which they would draw upon to quickly think of alternative routes:

"It can be frustrating if you get caught in a traffic jam or something but I'm lucky it's a relatively short distance…I know the area quite well so I know where I can take different routes to work where necessary and nip out the traffic… You have to be realistic about the fact that Edinburgh is a very busy city and the roads are not built for the volume of traffic …and you just have to accept the fact that if you are commuting during peak working hours, you're going to hitting busy time."R43, 32 year old single female

As R43 above, some other respondents with short commutes- 20 minutes or less- seemed to have accepted the problem of congestion and choose not to let it bother them:

"I do like driving, I think I have a fairly short journey compared to other people and I think it's not really worth, for 10 minutes a day getting that stressed about something, if you are going to be 10 minutes slowed" R37, 45 year old mother of 2

In order to reduce the dissonance and achieve internal consistency regarding the negative environmental impact of a regular car commute, some respondents have committed to a one or two day commute by active modes while others have instead bought more fuel efficient or lower emissions vehicles.

"… we had a great big car but you know we've always had it gas converted, partly because it's less expensive but also because we thought it was better for

> the environment so it's not that we're not completely anti-green …but buying the hybrid is more recent because we had a bad experience with our gas conversion so buying the hybrid cost us a lot of money but we think it was worthwhile" R78, 56 year old mother of 2
>
> "I feel I should do the right thing, in terms of the environment so I do try whenever I travel to choose a mode of travel that impacts least on the environment and is convenient so there's a trade-off there …Yes, so I bought a low emission car, it's in the lowest emission category…but it did cost more." R24, 59 year old father of 3

As illustrated by R24, respondents do seem to be making trade-offs, for example, some are willing to pay more in order to reduce the environmental impact associated with their commute without the need to forego the comfort, timeliness and control provided by the car. In addition the achieving of these goals is accentuated. For example many respondents emphasised the time saved by the car compared to the bus:

> "I'm interested in the environment and I feel guilty about driving alone in my car and polluting the place. I would prefer to either walk or use public transport but living where I am and working out here it just adds too much to my day," R11, 55 year old single woman.

Many other respondents express similar sentiments noting that in their ideal world they would prefer to use active modes or public transport but have to consider what they perceive as practical, as R42, 55 year old mother of 1, remarks:

> "I tend to look at things from the practical aspect, what's the easiest and the best way of doing things and I feel like the car is the best way to get back and forward to work."

Where the higher running costs for the car compared to other modes is concerned, these respondents tend to deflect the threat by denying its existence. The denial of this draw back as a threat is evident in the respondent's perception that the flexibility and freedom attained with the car are worth the cost. For respondents who live over 15 miles away, the cost of running the car and the total public transport are comparable. Some have been lucky to find car sharers close to their homes or at their work place, bringing down the running costs even further:

> "I also have a colleague … (who) lives in Dunfermline and 2 or 3 days a week, we'll car share so I'll drive south from Milnathort via Dunfermline, via (his) house and I either drop my car off and share with his car or he leaves his car and he comes with mine and we do that 2 or 3 days a week if we can and it helps us save on petrol and it also gives us an opportunity sit and chat on the route in and solve a few (work) problems as well, so it has its advantages." R14, 56 year old father of 3

From the above discussion, it is clear that the benefits of the car, namely, the freedom, flexibility, control, comfort and the time saved are accentuated and given more weight by most car - default respondents. As their car commute becomes established as a habit, the availability of the car becomes an easy answer to all other constraints such as the inadequate configuration of public transport, the poor active travel infrastructure or the complex trip chaining arising out of the social constraints. They seem content with expending only an economy of effort and become complacent, as R67, 59 year old mother of 2 aptly puts it:

> "I just simply go into the car; I don't have to think about it"

7.4 An "Extra Little Thing in the System"

A third of alt - default respondents have never had a regular car commute although almost all of them had learned to drive and had a driving licence. The 1970s and 1980s alt - default groups exhibited a self - motivation to commute by the alternative modes. The same goals, that is, cost effectiveness, timeliness and control, and comfort are considered, but as will be revealed by the discussion, their evaluation and the perception of their fulfilment is considered in a different way from the car - default commuters. These respondents are also aware of the drawbacks of the alternative modes. They concede that in general, a public transport commute takes longer than the car. They note the physical effort necessary for a cycling commute, and the unpleasantness of an active commute in poor weather, through the rest of the road traffic and on poor infrastructure. But this "extra little thing is the system" allows them to cope with these drawbacks and fulfil their commute goals. This is akin to Bandura's (1977) self - efficacy expectations. He defines an efficacy expectation as the conviction that one can successfully execute the behaviour required to produce the outcome. From their narratives, it is noted that this "extra little thing in the system" not only motivated the commute by alternative

modes but for some cases also demotivates the commute by car, as will be elaborated in the following discussion.

7.4.1 Cost Effectiveness: Not Pertinent

Apart from the significance of financial constraints at earlier key events in the life course such as further education, the fact that public transport or active travel is cheaper than the car, does not seem to be a major influencer towards their use later in the life course. They are, however, happy with the associated financial benefit:

> "Now I'm in a job where I could quite possibly afford one (car) but when I first started, I most certainly couldn't and because I didn't even try, I was able to save the money … and I was able to put down a deposit on a mortgage, that's why I'm now living in my own flat and I'm pretty certain that if I had insisted I really needed a car, I wouldn't be able to do that." R16, 42 year old single woman

7.4.2 Control and Timeliness: Control of the Situation

One of the most expressed drawbacks for public transport is the length of time it takes. These respondents were not oblivious to the time constraints faced especially in juggling children's activities with work commitments. R66, 55 year old mother of 2 illustrates:

> "It's a much more harassed commute coming back. We were very lucky our child minder didn't mind if we were a bit late but… it's not so comfortable."

Some respondents noted that at times, the alternative modes were just as fast or faster than the car. Buses for example were aided by the bus lanes and so could be faster at peak times. This is one of their motivations to stick with the alternative modes.

> "And that is another reason because on Calder road, you can just shoot down the bus lanes and the same where we stay on Glasgow road, it can get quite congested and the buses you can shoot down." R12, 53 year old mother of 3

While the respondents that expended minimal effort to enable their commute seem to prefer controlling the commute in order to get to the other activities, the 1970s and 1980s alt - default respondents seem to have their commute as a constant around which the other activities are organised. In the previous section, timeliness and control were complementary goals while for these respondents, the goal of control seems even more

significant. In addition, the control they strive for is not only of their commute journey but of situations that preserve their perceived self - identity.

Some respondents had low efficacy expectations towards their successful commute by car. For one respondent, this low efficacy expectation is a result of a car accident in their childhood, the trauma of which keeps him from ever driving. Another respondent had very poor eyesight. Few respondents shared their lack of confidence in their own abilities, and because of that they considered themselves more of a hazard to other road users while using the car. By using public transport, these respondents feel more at ease and in control during their commute:

> "I just feel like I can't do multi-tasking and I fear even crossing the roads if I don't follow the traffic lights, so that would be the problem for me really, I think it is a personal issue, …I make sure that everywhere I go, there must be public transportation for me to, because that's the easier route for me really and if you get stuck, you can ask staff and I don't have to worry about directions, when I get on a train or a bus you can relax, …" R61, 31 year old single female

R61 highlights the issue of controlling the situation in order to enable their travel, by settling where there is availability of public transport. Other respondents have also enabled their alternative modes commute but are instead motivated by strong personal beliefs about the lifestyle they want to lead:

> "All of the times I've looked for somewhere to live, I've wanted to make sure that I wouldn't be forced into driving, … we wanted somewhere with a garden for the children and I wanted to be able to not have to drive" R29, 50 year old father of 3

> "When I was younger, I considered learning to drive but because I decided that I wanted to live in a city, I felt like it wasn't a necessity" R72, 34 year old single man

Respondents with strong environmental beliefs also seemed to draw on this expression of their identity to boost their efficacy expectations towards a bus or cycling commute. R8, 60 year old mother of 4, describes the motivation behind their actions:

> "It depends on how high you place that on your list of priorities and if I look back over my life, I probably regret the fact that we didn't give up the car sooner

> because by not behaving in the way that you think is better, you are actually acquiescing in doing things that you don't think are right … if you say I don't have the time, you are actually saying I don't have the time because I need more time to do other things, because everybody has a bit of time so it depends on how you choose to spend that time. … I think if you really believe in it, you have to do it and just say, well I'll just take a bit longer but I have to do this and the other because it's important"

For these respondents, the way they commuted seemed to be an expression of their commitment to do their part for the environment. They were more willing to go through the hassle of some long commutes, the anxiety of waiting for a bus or some awkward trip chaining in order to maintain internal consistency regarding their environmental beliefs. Those with children are further motivated by the desire to inculcate this lifestyle to their children.

7.4.3 Comfort: Peace of mind

Achieving the goal of comfort for some of these respondents takes the form of avoiding a stressful commute. Some noted the stress experienced while driving as one of the factors that pushed them towards using the alternatives:

> "that is actually another reason why I don't take the car because in Edinburgh it's just- when its busy and people are just (grrr) there are certain bits where people get so angry …I actually saw 2 people get out and start shouting at each other, I just find that too stressful" R12, 53 year old mother of 3

For most of these respondents, comfort within a public transport or active travel commute seems to have been achieved by a change of mind-set, rather than the situation, as R41, 59 year old mother of 2 illustrates below. This change of mind-set seems to have motivated them to a certain level of vigilance, whereby they are always prepared in the event of poor weather conditions:

> "The thing is everything should be in your mind. … I realised the cold you suffer, it's not because the weather, it's because you inadequately dress yourself. …so just with time slowly, you learn to change"

> "You just get into the mind-set: right I'm going to cycle, and actually I prefer it, it's slightly quicker. … I suppose I've improved the gear, the weather gear, I've

got decent coat and stuff so I've gradually improved all that because I've taken it more seriously." R45, 50 year old mother of 2

R45 above demonstrates that with the change in mind-set, the comfort achieved seems to be enhanced as the respondents get used to the situation, and even start to enjoy and prefer it to the use of the car.

7.4.4 Coping Effort: Fundamental Change and Reconstruction of Meaning

As mentioned earlier, the 1970s and 1980s alt - default respondents are aware of the drawbacks of their chosen modes: the longer commute; more physical effort; and the discomfort due to weather. The coping strategies they employ seem to be geared at resisting the inclination to fall back on the easiest option and forge ahead with a mode other than the car. They are acceptance strategies, in particular a fundamental change in their mind-set.

Some respondents had 45 minutes to 1 hour commutes which could have been quicker by car. Respondents seem to cope by accepting the situation, recognising and reminding themselves of its salutary nature:

"Once you've resigned yourself, you kind of get better at it. I remember when I first got rid of the car, I used to find having to get the bus just awful because I wasn't used to the discipline of- okay the bus is leaving at 8.10, no you can't get there at 8.11, it may have gone, … so over time I have learned just to discipline myself to having to do what you have to do and I think it's quite salutary," R8, 60 year old mother of 4

Other respondents cope with the long public transport commute by a change in mind - set similar to that discussed as their means of achieving comfort in commute. One respondent noted the time on the bus as "stolen time"; a chance to momentarily forget about the hustle and bustle of the day and instead fill that time with a more relaxing activity as R69, 61 year old father of 2 notes:

"I can sit on the bus and I can read a book or can check my email."

The drawbacks to active travel mostly concerned cycling, and these included the physical effort required, poor weather and poor infrastructure. Recognising the fact that they may not have the stamina required for a cycling commute, as one would need to

physically exert oneself more while cycling than driving the car, some respondents reported a commitment to building up their stamina slowly:

> "I gradually worked my way up to coming- I first came all this way on a Sunday and I thought right I cycle all the way to work and then I started my goal was once every 2 weeks but that was all the way here and back and then I thought I could do it every week." R21, 62 year old mother of 2

For some of these respondents, their commitment seemed to be rooted in a felt personal obligation to do their part for the environment as R21 further illustrates below:

> "I think … working in CO2 storage, I thought it was a good idea to cut down my CO2 and then I can say to people, you know I save a bit. I think because I like fresh air and exercise so cycling is brilliant in the morning"

Others accentuated the benefits from cycling such as the exercise they are able to build into their daily schedule:

> "…*how can I fit in more exercise* is probably part of how I think about things and I need to try and squeeze a bit of time to exercise into my hectic life" R38, 38 year old mother of 2

The discomfort caused by poor weather was not only commented on by active commuters but also bus commuters. They were unfazed by the poor weather conditions noting that they only had to dress appropriately for it as R4, 53 year old single woman notes below:

> "it was an issue previously when I was used to jumping in and out of the car, then you went for the bus and you realised that you couldn't, you have to dress differently in Scotland if you're not going to be using your own vehicle door to door so I did think about decent footwear, I started wearing hats more, gloves"

The change in mind-set towards poor weather conditions seems to have led to the denial of these conditions as a threat to the commute. The general tendency of these respondents towards the weather was to down play the discomfort caused by wet conditions as R52, 39 year old mother of 2 does below:

> "A bit of rain is okay, I'm Scottish I can cope with some rain"

7.5 Conclusion

This chapter proposed that in order to preserve a desirable state for the structure of identity and the self - efficacy expectations towards a particular mode, different meanings were filtered out by respondents belonging to different judgement of effort segments. These different meanings were underscored by the different perceptions of similar commute goals. Below is a comparative summary of the different meanings attached to commute goals by respondents who tended to economise mental effort and those who drew on an "extra little thing in their system". It illustrates the difference in the needs, interests and preferences between the two groups.

- **Cost effectiveness:** The cost for using the mode was not a big influencer except in the early stages of the life course. Mental effort economisers were able to commute by car with no remarkable financial hassle later in their life courses while those who exhibited an "extra little thing" do not express financial savings as a pertinent issue in their current commute.
- **Timeliness and Control:** Respondents who tended to economise their mental effort aimed to control their time through shortening the commuting time and ensuring they were able to come and go at the exact time they wanted to without having to consult the bus schedule for example. The respondents who drew on an "extra little thing in the system" tended to control the situation rather than the time. They seemed to organise events around the commute rather than the commute around the events, for example by allowing enough time between activities. They also underwent a change in mind-set allowing more positive attitudes towards longer or more physically exerting commutes and so reduced the anxiety they would otherwise have felt.
- **Comfort:** Mental effort economisers tended to aim for a more comfortable external environment in terms of shelter from the elements, personal space and extra physical effort. The possibility of changing weather conditions was more likely to influence their mode choice; personal space issues such as their own car compared to the bus interior or their own shower compared to shared showers at work was used to discount alternative modes; and the need to carry an extra load whether for work or related to children's activities had them quickly switching to the car. The "extra little thing" respondents seemed to aim more for comfort in the mind in terms of reduced anxiety related to the commute. This was due to

a change in mind-set which allowed them not to be as bothered with the external environment as the mental effort economisers.

- **Coping Strategies:** When the expression of their self - identity through commuting by a particular mode seemed to be threatened, the respondents in the different categories employed different coping strategies. Economisers of effort, recognising the negative impact of car travel, downplayed their contribution to the problem. They compromised by using more fuel efficient cars, or creating time for exercise. The respondents who drew on an "extra little thing in the system" coped with the negative aspects of a public transport or active commute by making fundamental changes in their lifestyle and mind-set. They ascribed more positive meaning to the commute experience. Some valued it as allowing time for exercise or relaxing while others saw it as their contribution to the problem of carbon dioxide emissions and climate change.

This chapter more clearly demonstrates the significant role that motivation (the conscious or unconscious needs, interests and preferences that prompt action in line with identity) plays in the exercise of agency to engage a particular travel script. The chapter shows that the same commute goals are evaluated differently and ascribed different meanings so that the perception of their satisfaction is in line with a self - identity such as the identity groups proposed in this study. This distinction in evaluation of the same commute goals is made possible by the different needs, interests and preferences individuals possess. In order to sustain the commuting behaviour and engage the same or similar travel script for each commute journey, the coping strategies used are also geared at satisfying these needs, interests and preferences in line with an individual's self - identity.

Chapter 8: Personas

8.1 Introduction

This chapter brings together the discussions in Chapter Five which mainly considered the construction of a travel script; and that in Chapters Six and Seven which looked mainly at the engagement of the travel script. Chapter Five considered the knowledgeability factors that are incorporated into the travel scripts; Chapter Six looked at where, along a life course, a different travel script was engaged and sustained to the present, that is, the commuting turning point; and Chapter Seven considered the internal states and latent factors - such as the identity, goals in line with it and the social - psychological attributes behind these goals - that motivate the continued engagement of a particular travel script.

With regard to concepts from Structuration theory, Chapter Five illustrated structure as knowledgeability factors that make up a rules - resources set that enables and constrains agency. It also demonstrated the exercise of agency through reflexive monitoring; and the reflexivity of the relationship between structure and agency. Chapters Six and Seven demonstrated that motivation was a significant aspect of agency in the engagement of a travel script. By presenting the key issues from these chapters together, this chapter aims to illustrate not only the interdependence of situational and social - psychological factors in the construction and engagement of a travel script, but also the duality of this mental structure.

8.2 Creating the Personas

A persona is a representation or composite sketch of people in a particular group. In Chapter Four, the largest groups within which the narratives were categorised were based on the current default commute mode. They were two groups: car - default and alt - default. This grouping was based on the assumption that a travel script or mental structure would evolve as the life course progressed to resemble the travel script that is currently engaged to commute to work. The idea was to trace this development or evolution using the different key events faced.

When the grouping according to cohorts was applied to these two large groups, six groups emerged- the 1970s, 1980s and 1990s car - default groups and the 1970s, 1980s and 1990s alt - default groups. The discussion in Chapter Six showed clear distinctions

in the commuting trajectories of the six groups. The personas were therefore created to fit within these groups and used to discuss the formation, development and reinforcement of the travel script along a hypothesised life course. The attributes of the personas were based on what was reported by the majority of respondents in that group. These attributes include: their age, number of children and their likely age, distance from work, whether there is a direct public transport or active travel route between home and work, and how long they have been commuting by their current travel mode.

Figures 8.1 to 8.6 synthesise the information from Chapters Five, Six and Seven and by presenting it as one individual's experience, a holistic and deeper understanding of the travel script as the link between situational and social - psychological factors can be gained. Based on the narratives of respondents in a particular group or collective trajectory, the figures show when an individual would have experienced different life cycle events and the modes used then. The figures also show the commute goals that the majority in a group aimed to satisfy, what they accentuated as a threat to their current commute mode and the strategies they use to cope with the threats. The personas are therefore a composite sketch of the situational factors faced and the social - psychological attributes of a typical person in any one of the six groups.

The chapter is structured by presenting the narratives of each persona. Their key attributes are first presented to provide general information about that character. The narrative then takes the reader on a walk through their mobility biography or life course, noting the key events that were experienced and the situational factors they presented that affected the commute. A turning point in the mobility biography is also noted. This turning point will be seen to mark the start of the engagement of the travel script currently in use. The commute goals that are satisfied by that script are discussed and depending on what is accentuated, are noted to be in line with a facet of the persona's self - identity as expressed through the commuting behaviour. The factors that could threaten the engagement of the script after the turning point are considered as threats to the expression of that facet of identity as well. The coping efforts of the persona are discussed and seen to also be in line with the facet of self - identity expressed by their commute.

8.3 Adam - 1970s Car - default

Adam represents the 1970s car - default trajectory. His mobility biography generally follows the outline in figure 8.1. He is a 58 year old father of two, both in secondary school. Adam is an academic at Heriot-Watt University and lives about 9 miles from the university at the outskirts of Edinburgh city with his wife and children. There is no direct public transport route between his home and work. They have one family car and Adam has been commuting to work by car for about 20 years now.

Adam went to university in 1974 and during that time commuted to the university by walking. The university was close enough to walk and it was also a way to save money at a time when he was quite financially constrained. In 1978, at the age of 22, he acquired a driving licence. This was about the same time that he started his first job. Even though he had his driving licence, he commuted to work by public transport. At this time, his work place was too far to walk and he still faced financial constraints that did not allow him to own and run a car. In addition, his work place prioritised parking for employees who had been with them longer. He would have, therefore, had to pay for parking and this would have added on to the cost of running a car.

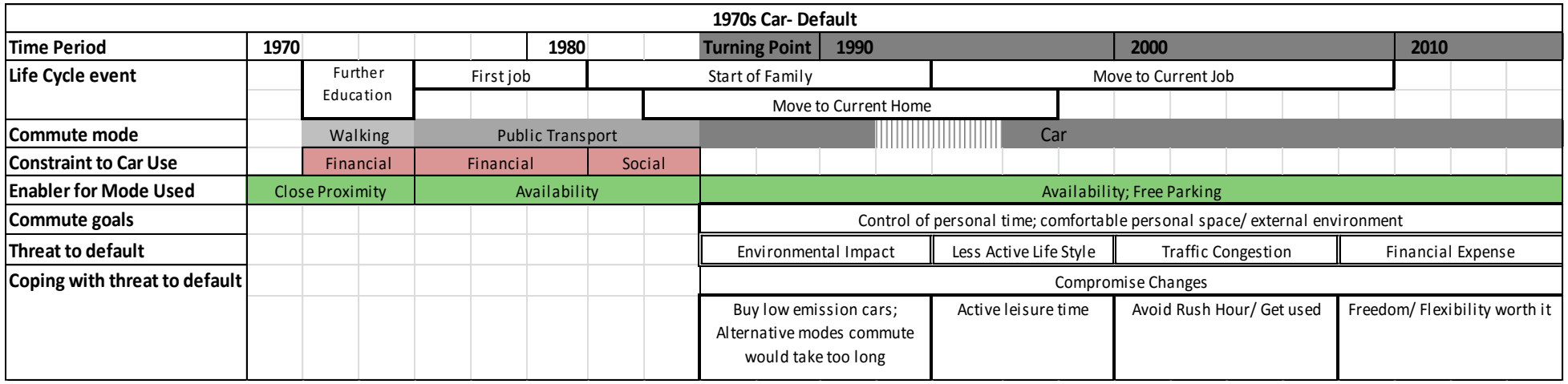


Figure 8.1: Commuting biography for persons in the 1970s car - default cohort or trajectory

1984 marks a turning point in Adam's commuting biography. At this time, he started commuting to work by car. Having worked for a few years, he could afford to run a car. As shown in figure 8.1, he had his children between 1982 and 1991. The constraints associated with children's activities seemed to put a strain on his time. The speed and flexibility of the car eased that. In addition, Adam moved to his current home in 1991/1992. The choice of where to move was driven by a desire to have a more ideal place to raise children and the cost of housing:

> "I chose it (current home) for a number of reasons, the school, there was a house with a garden, (I was) planning (for the) kids, I used to stay in an Edinburgh tenement in the town centre which is great when you're young, free and single because I could walk into the pubs and clubs and things but the thing with family, you're wanting to have a garden so it was part of the deal for doing that as well and then being on the edge of Edinburgh, it was cheaper so it was cost implications as well."

These were the situational factors that Adam accentuated as having led to the turning point and reinforced his decision to commute by car. Adam moved to Heriot-Watt University in 1999 and its location at the outskirts of the city seems to have further reinforced his choice to commute by car.

> "…because of the way the buses run, it's not convenient to go from the edge of Edinburgh to the edge of Edinburgh. You have to go into the middle to come back out again…"

He also noted the advantage of the free parking at the university:

> "I tell you one of the good things about Heriot-Watt travel wise is free parking and for someone who has paid for parking for years and years, that was quite a bonus. My last place, parking cost was £250 a year, so that's quite a big financial bonus every year. It doesn't make a difference to me but I think a lot of people don't realise how big that is, Even if you work in the town centre, it's not guaranteed you'll get a parking space…it's quite a nice campus for cars"

Commuting expresses a facet of Adam's self - identity and as far as travel to work is concerned, Adam can be considered as a mental effort economiser. This is evident in what he accentuated about the goals for his commute. He desires control in his commute. In particular, he would like to have control over his personal time and the

commute is seen to dig into that. Therefore, he aims to spend the least amount of time possible commuting:

> "It's just a time issue. I have to say that this place is very busy, we're short staffed and I need to spend as much time at my work as I can so spending time travelling cuts into my day… I like to get to work early and leave at 5.30 deliberately, to see my kids, have my evening meal with them…"

He also aims for a comfortable commute. In particular, Adam likes to have a comfortable external environment and especially to be protected from poor weather:

> "cycling the whole way, you're looking at an hour on your bike and say the weather was as pleasant as it is today (rained all day) in other wards rubbish, it would play on your mind from about 3 o'clock thinking oh god, I've got an about an hour of sitting the bike in this. …so life's too short for that, so I drive"

Adam is not oblivious to the negative impacts of commuting frequently by car, for example, the negative impact on the environment, the less active lifestyle, the traffic congestion and the financial expense. These could be viewed as threats to his chosen commute mode and indirectly as threats to this particular expression of his self - identity. Below, he notes some of the ways he copes with these threats:

> "I feel I should do the right thing, in terms of the environment so I do try whenever I travel to choose a mode of travel that impacts least on the environment and is convenient so there's a trade-off there…., so I bought a low emission car, it's in the lowest emission category"

> "I can drive here on a good day in about 10 minutes. In the morning I give myself about 15 minutes and usually in the morning at 7 am, that's fairly straight forward. At night I tend not to leave here until after 5:30 deliberately because that allows the traffic to get going"

> "The best thing about the car is the speed and convenience, the worst is possibly the cost"

From the above, it is clear that Adam compromises between the threats he recognises and the social - psychological attributes associated with the car, namely, the freedom, convenience and flexibility it allows him to satisfy the commute goals in line with his self - identity.

8.4 Becky - 1980s Car - default

Becky's commuting biography is in line with the 1980s car - default trajectory outlined in figure 8.2. She is a 46 year old mother of two: one in primary and the other just started secondary school. She lives with her husband and they have two cars in their household. She works in professional services at Heriot-Watt University and lives about 10 miles from work at the edge of Edinburgh city. There is no direct public transport route between Becky's home and work. She commutes to work by car and has done so for over 20 years.

Becky attended university from 1985 to 1989 during which time she commuted by bus. The main reason for this was the availability of a direct bus route and the inability to afford a car at the time. In 1988 at about 19, she acquired her driving licence. She started her first job in 1989 and a few years later, had access to a company car. The 1980s were the era of the car and many companies at the time offered their employees cars. From figure 8.2, this time is seen to be a turning point in Becky's commuting biography since she has commuted to work mainly by car since then. Other key events such as starting a family in 2000, moving to the current job and Heriot-Watt in 2004 and her current home in 2005 can be said to have presented situations that reinforced the decision to commute by car. For example, she notes the constraints related to children's activities:

> "… the location for me of the nursery and my home and my place of work wasn't straight forward enough to just be two parts of the journey and I wasn't working flexibly so the times were quite tight to get from nursery to work and then work back to nursery. But when they are at primary school, that's even more complicated particularly when you've more than one, one might be at nursery; one might be in school, so you might be doing 2 or 3 pickups from different places just at the start and end of the day and then the afterschool things beyond that…"

Like Adam, she moved to her current home because of the cheaper house prices outside Edinburgh city. In addition, the current home is close enough to her husband's work place as well as to their families who reside in Edinburgh. The location of the Heriot-Watt Riccarton campus in relation to her home outside of Edinburgh presented the same pubic transport challenges that were highlighted by Adam.

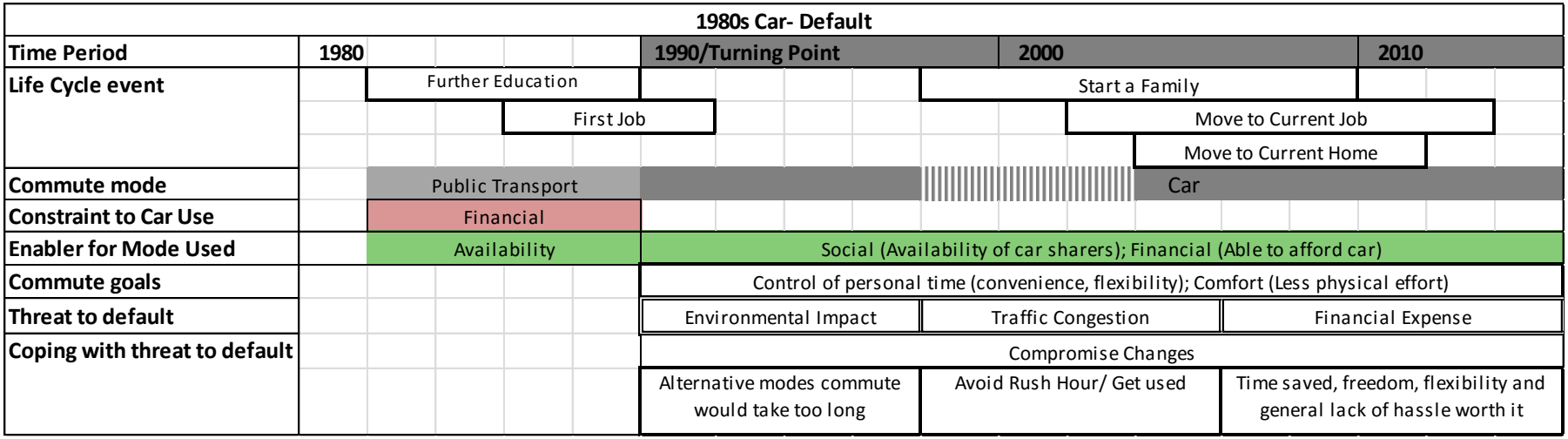


Figure 8.2: Commuting biography for persons in the 1980s car - default cohort or trajectory

On top of these situational factors, Becky's current travel script is driven by certain commute goals whose satisfaction has to be aligned to a latent self- identity. Her commuting behaviour portrays a facet of her self - identity more in line with mental effort economisers. She aims, for example, for the least amount of time spent in commuting so that she can have time for other activities:

> "Any other method for commute purposes is going to add on to my day. I mean I have a relatively short commute compared to some people and it would add on to my day if I used another method of transport"

A comfortable commute in terms of the least physical effort exerted as well as the perceived safety of the mode is another of her commute goals:

> "(It) isn't just a road safety issue but the main reason is that I probably take an hour or so to cool down, it's pretty uncomfortable, I know we got showers here but, first hour there I'd probably feel very uncomfortable and obviously on the way home too so it's not that practical. Physically I don't think I'd be able to do it either"

Figure 8.2 notes the negative aspects of a car commute that might threaten Becky's particular expression of her self - identity. Becky, like Adam, copes by compromising. She accentuates the positive attributes associated with the car as illustrated below:

> "The expense of running a car and owning a car is I suppose- but I do not see that as (an issue) because I have the flexibility and freedom of the car."

And downplays the threats:

> "But I like to walk, it's not like I want to use the car all the time but because of where I live, things are not on my door step… I do enjoy walking and I walk for leisure in the evening with friends but the car is for commute and out and about weekend, shopping and stuff"

> "I think I have a fairly short journey compared to other people and I think it's not really worth, for 10 minutes a day getting that stressed about something, if you are going to be 10 minutes slowed"

8.5 Christine - 1990s Car- Default

Christine's commuting biography represents the 1990s car - default trajectory as outlined in figure 8.3. She is a 35 year old woman who lives with her partner about 10 miles from her work place at the Heriot-Watt Research Park. They do not have children. They have one car in their house hold which she uses to commute to work. There is no direct public transport route between her work place and home.

Christine attended university from 1996 to 1999, where depending on the weather and available funds, walked or took the bus to university. In 1999/ 2000, she started her first job after university and commuted to it initially by public transport. Later, when she was able to, she bought a car in 2003 and has commuted to work by car since. This was her commuting turning point. She moved to her current home and job at about the same time in 2006. The choice of home was influenced by the need for privacy, financial reasons and the distance from work:

> "I didn't want to move into a shared accommodation where they may not appreciate having somebody else, so I decided I'd rather live by myself and anywhere closer to the city would have been more expensive and more difficult for parking and I definitely wanted to keep my car to be able to go to my home town, …it was less than half an hour and I don't like to commute for a long time, I'd much rather move closer to my work and shorten my commute if possible"

As with Adam and Becky, the location of the home and job reinforced the decision to commute by car.

The above quote also illustrates one of Christine's main commute goals- the need to control the commute such that a minimum amount of time is spent in it. The car's speed and flexibility was able to fulfil that goal for her as further illustrated:

> "It's so easy to rely on the car and you can leave the house when you want to. You don't have to be constrained by bus time tables and you go from door to door whereas you'd have to walk to bus stops and that type of thing."

1990s Car- Default										
Time Period	**1990**				**2000**	**Turning Point**				**2010**
Life Cycle event		Further Education			First Job			Move to Current Home		
								Move to Current Job		
Commute mode		Walking/ Cycling/ PT			Public Transport	Car				
Constraint to Car Use		Financial								
Enabler for Mode Used		Close Proximity			Availability	Financial; Free Parking				
Commute goals						Control of Own time (flexibility); Comfort (Against poor weather, perceived safer than cycling, no hassle)				
Threat to default						Environmental Impact				Traffic Congestion
Coping with threat to default						Compromise Changes				
						Low emission cars; Time Saved; Need to get to remote recreational Activities				Use Alternative routes; distract oneself wiith music; get used

Figure 8.3: Commuting biography for persons in the 1990s car - default cohort or trajectory

Figure 8.3 notes another commute goal related to the comfort of the journey. Christine seems to aim for comfort in her personal space, safety and shelter from poor weather. Their satisfaction further reinforces her choice to commute by car:

> "I think also the buses are very crumped, also in the winter time you can see them driving past my window here and they're all steamy, they look very moist and you think people are coughing and you catch all these bugs so that ties into other things as well"

> "The girl who cycles here tells rather hairy stories on what it's like on the roads here and she is a really confident cyclist so she doesn't feel me with much confidence"

> "I think the worst thing is when the weather is not good. It's okay in the summer, I don't mind that, you see when it's getting to winter and it's dark and it's cold and there's horizontal rain and wind, it's the waiting at the bus stop"

The satisfaction of these goals through a car commute expresses a facet of Christine's identity. For commuting in particular, Christine can be said to be a mental effort economiser. When this identity expression is threatened, for example by the factors noted in figure 8.3 - environmental impact and traffic congestion - Christine, like Adam and Becky, is seen to make changes to compromise with the situation. She now drives a low emissions car and accentuates the convenience the car affords her to easily carry her lap top and go to meetings during the day. She also downplays the threat of traffic congestion noting that:

> "It can be frustrating if you get caught in a traffic jam or something but I'm lucky it's a relatively short distance…I know the area quite well so I know where I can take different routes to work where necessary and nip out the traffic…"

8.6 Doris - 1990s Alt - default

The 1990s alt - default persona whose commuting biography is shown in figure 8.4 is presented through the character of Doris. Doris is a 33 year old single woman; she has no children; and lives on her own. Her home is about 7 miles from her work place at Heriot-Watt University along a direct bus route and relatively direct cycle path. She commutes to work by bus.

Doris attended university from 1999 to 2002. At the age of 18, she acquired her driving licence but did not start commuting by car. She commuted to university by bus. When she began her first job in 2002, she lived in a city with a poor and slow public transport system - according to her – therefore, she commuted mostly by car and sometimes by bus. Having gotten the job at Heriot-Watt University in 2010, she looked for a place of residence closer to the city, for social reasons and also to be able to access her work place as she says below:

> "I was new to Edinburgh and I wanted to live in the centre and live somewhere that was on a bus route up to here because I had got this job so I knew that I needed to be able to get the bus, even though at the time I did have a car, but I just chose not to. I was new to the city I didn't want to have to drive, parking where I live is a problem so if you move your car, it's unlikely you'll get the car (parking) back…, it's close to everything, just because Edinburgh is very- once you're in the city centre you can walk everywhere so I like that, I like to be able to walk around in the evenings or the weekend"

The quotation above illustrates some of the infrastructural constraints Doris faced against using the car. These arose from her choice of home - closer to the city centre. It is difficult to pinpoint a turning point in Doris' commuting biography as she has only commuted by public transport for 4 years while she previously commuted by car for about 7 years. In both cases, she seems too have been influenced by the situational factors.

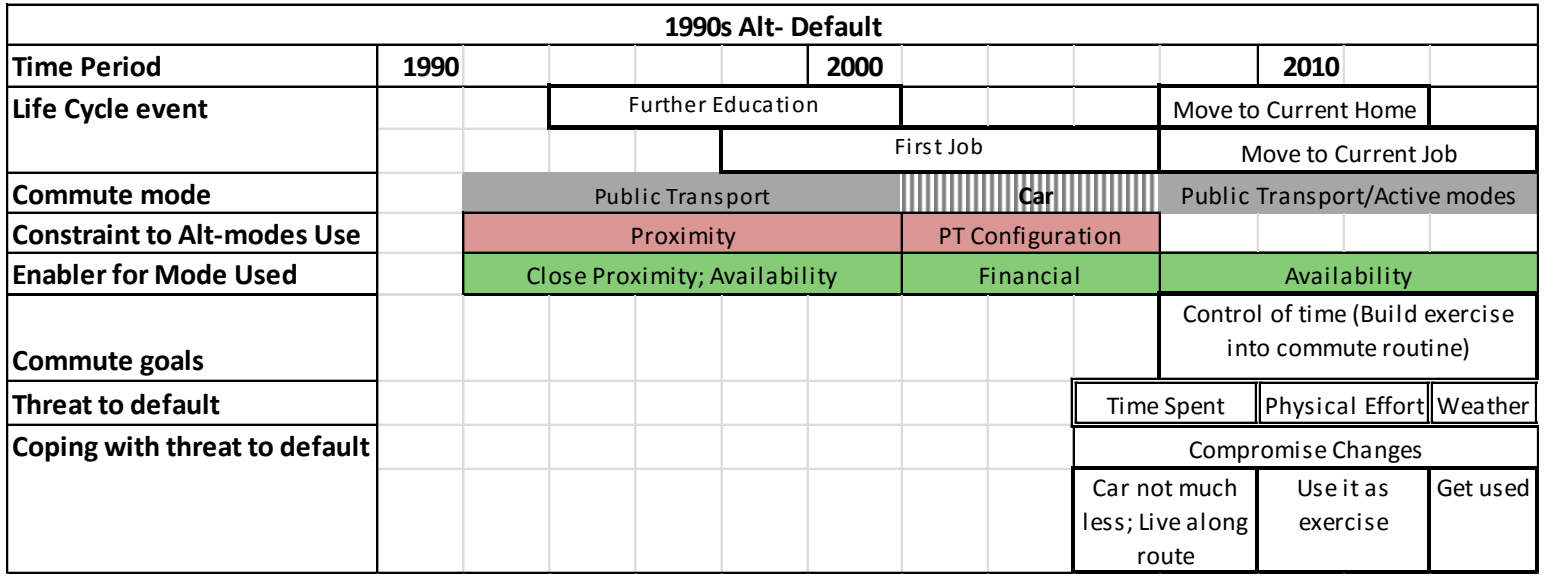


Figure 8.4: Commuting biography for persons in the 1990s Alt - default cohort or trajectory

Even though Doris currently commutes by bus, her perception of the satisfaction of her commute goals and the way she copes to threats to her chosen travel script put her in the category of mental effort economisers. At the moment, commuting by car seems for Doris, more of a bother than commuting by bus.

Her commute goal of achieving control over her personal time can be illustrated by her choice not to use her car, as it would take a bit of time trying to find a parking space close to her home. In addition, she looked for a home with not only a very direct and frequent bus route to work, but also close to other social activities she wanted to go to in the evenings and on weekends. These are compromise changes. She also downplays some of the threats mentioned in figure 8.4 such as the time spent on the bus or the poor weather saying:

> "I don't have too many problems… because I get the 25 which is every 10 minutes … 15 minutes is not a long time to wait. Where I get (the bus) there's bus stops but no bus shelter so if it's raining, you get soaking wet… just have to get used to Scottish weather, dress appropriately or get used to being wet"

8.7 Emily - 1970s Alt - Default

Emily represents the 1970s alt - default collective trajectory. She is a 57 year old mother of three. She lives with her husband about 6.8 miles from her work place at Heriot-Watt University. Even though there is no direct bus route between her home and work, Emily commutes to work by bus and has done so for over 10 years.

As figure 8.5 outlines, Emily attended university from 1974 to 1978 where she took the subway for part of the way and walked the rest of the way to university. Although she had acquired a driving licence at 21, she did not commute by car to her first job in 1978. Like Adam in the corresponding cohort but car - default trajectory, her work place at the time was too far for walking and she could not yet afford a car. Emily moved to Edinburgh when she got married and had her children between 1982 and 1990. She worked part time during this time but due to the constraints related to the children's activities and her work hours, Emily started commuting to work by car in 1986:

> "Then (I) fell pregnant with my 3rd child and I just thought I didn't have the time. I worked part time hours and it was handy… just along the road which was great for walking but unfortunately…I had to take the car because it just wouldn't work. I had to try to drop her off, drop the boys at school, go to work

> and it just would have added so much time on to the day. If I had (used the bus) I don't know how I could have done it. I needed to pick the boys up because they went to a separate child minder after school, or to an after school club, pick them up and then pick (daughter) from the child minder so that became car."

Emily and her family moved to their current home at the outskirts of Edinburgh city in 1994 in order to be able to access the primary and secondary schools they desired. In 1998, when Emily started her job at Heriot-Watt University, her children could walk each other to school. This was her commuting turning point as she decided then to commute by bus:

> "And then I came and work here. Initially I did think this was far too far out, it would be ¾ of an hour and 2 buses but I do like to try and think. It was more an exercise thing for me, I'd rather walk somewhere get fresh air especially first thing in the morning, you feel better, having a walk, having a bit of fresh air, rather than getting in the car, you can't do work when you're sitting in"

The quote above illustrates Emily's resolve to use the bus despite the constraints. It also expresses Emily's commute goals which represent the commute goals of respondents making up the 1970s alt - default collective trajectory as shown in figure 8.5. Emily aims for independence from the car for her commute, therefore she takes time to consider the situation and arrange it such that she can use the bus. She also speaks of the desire for fresh air in the morning so she can feel more comfortable at the start of the day. The goal for comfort, unlike Adam, seems more related to her state of mind rather than her external environment.

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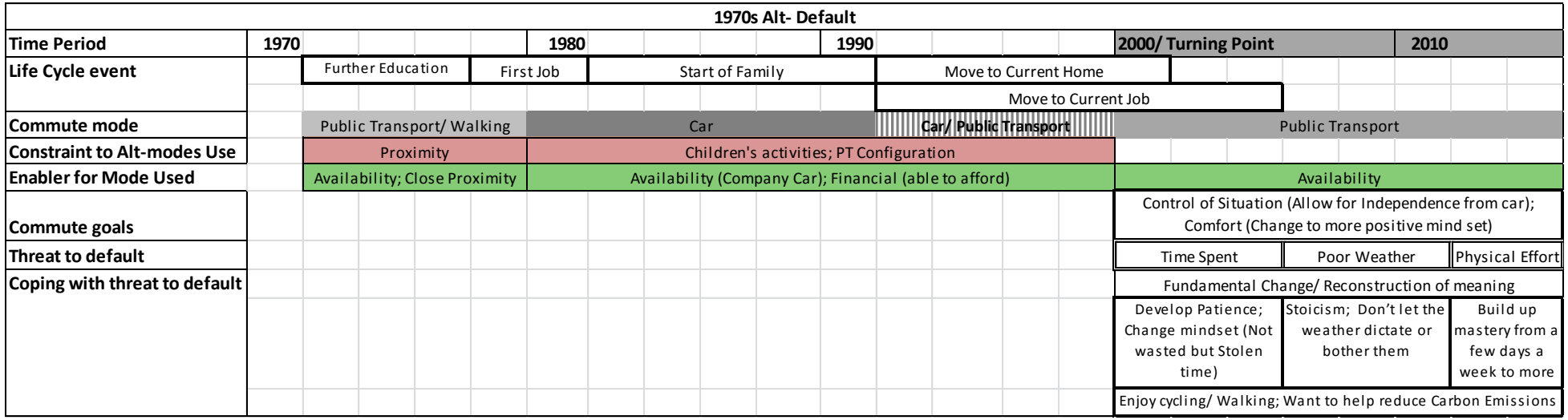

Figure 8.5: Commuting biography for persons in the 1970s Alt - default cohort or trajectory

The facet of her self - identity that Emily expresses by her commuting behaviour is of one with "an extra little thing in the system". Emily deals with the threats to this expression of her identity by a strong resolve for a fundamental change. She is aware of the long 45 minute commute but allows time for it; and she downplays the poor weather:

> "And the weather hasn't even influenced me because I found I dress appropriately for the weather…Standing at bus stops, being in the rain. I've got decent footwear and decent clothes so…"

In addition, she enjoys the exercise from the walks between home, bus stops and work. With this fundamental change, she has come to view her commuting time with a different meaning: as time to relax or read, rather than wasted time that is only for getting from home to work and vice versa.

8.8 Frank - 1980s Alt - default

Frank is a 47 year old father of two; 12 and 15 year olds. He lives with his wife and children about 6.7 miles from his office at the Heriot-Watt Research Park. Like Emily, Frank usually commutes by bus even though there's no direct bus route between his work and home. During the school holidays, Frank cycles to work.

His commuting biography is as outlined in figure 8.6. Frank attended university between 1984 and 1988 and walked to university as it was in the city and most things were within walking distance of his flat. In 1989, at the age of 22, he acquired his driving licence. He also started his first job and it took him about two hours to commute by bus. He did that for a short while until he bought a car, then he drove to work. Sometimes he used public transport when his wife needed to use the car. In about 1997, at another job, Frank's employer offered a package to pay for an annual public transport ticket by instalments. Frank then cycled part way and got the train the rest of the way to work. This was his commuting turning point.

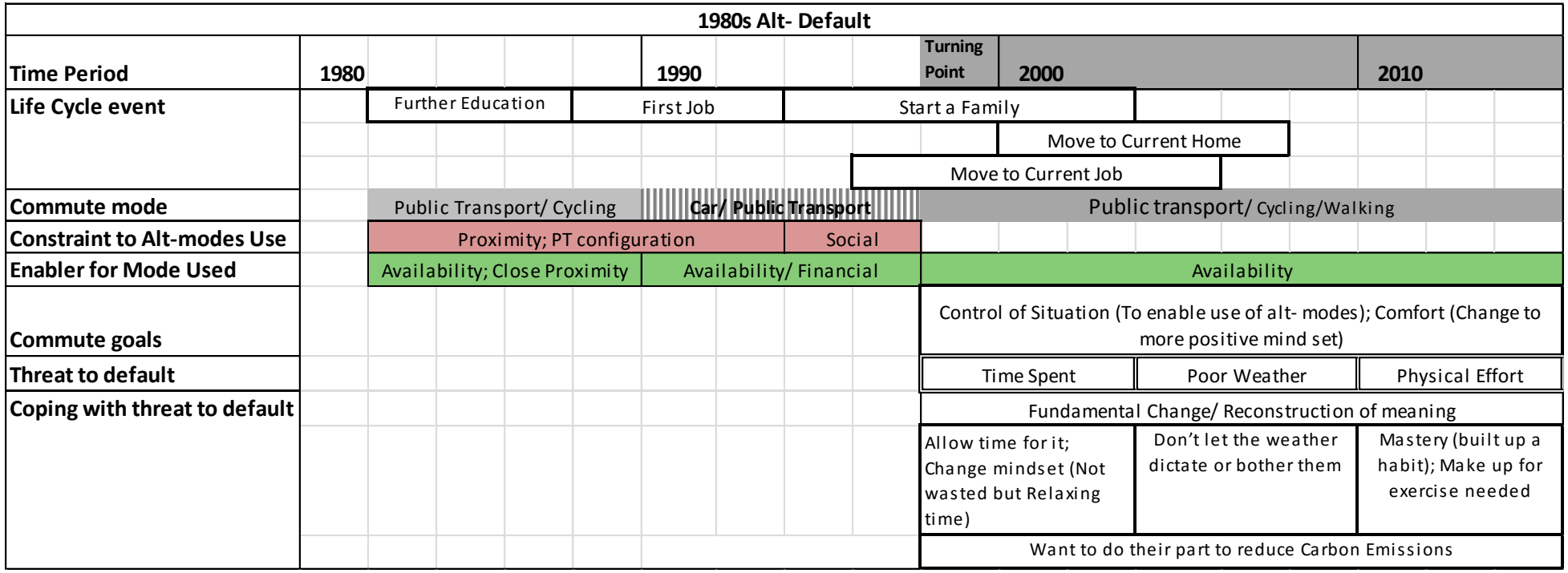

Figure 8.6: Commuting biography for persons in the 1980s Alt - default cohort or trajectory

Frank started working at the Heriot-Watt Research Park in 2000 and cycled to work. They moved to their current home in 2002 because they liked the area and at the time, it was close to where his wife worked. He had his children between 1999 and 2002 but still managed to cycle to work as the nursery school was close to his home. Once the children started primary school, Frank began to use the bus:

> "But once she was going to school (I) couldn't really cycle anymore so what we started doing and more or less still do today is catch the bus. So I used to catch the bus and drop them outside the school then I would change buses. When I had my 2nd child, she sort of fitted into the commuting pattern we were having but in the last couple of years, they are old enough now and…. I sort of get on the bus with them and as the bus goes past their bus stop they get off and go on to the school and I just carry on. Up until 2 years ago, I was getting off and then walking them to the school gate but I stopped doing that so that's my commute."

Like Emily in the 1970s alt - default cohort, Frank chooses to take the bus despite the constraints; and structures the situation to allow him to use the bus. His commute goals of control and comfort are satisfied when they are in line with his strong environmental beliefs. He notes:

> "We could have had 2 cars in the family and I could have driven here as well, 2 cars just seems not right…I think the initial choice I made to start cycling places was for environmental reasons…"

The strong environmental beliefs appear to be the root of the "extra little thing in the system" that motivates the engagement of Frank's travel script. He copes with the threats his expression of self - identity by making fundamental changes and restructuring the meaning of his commute. For example, he chose the bus over the car when faced with time constraints related to his children's activities. He sought measures to allow him undertake the long commute he would have to do by bus:

> "What I did when I started commuting on the bus here, I made an arrangement that I would be in a bit later so people didn't expect to see me here before 9.30 in the morning. I do the drop offs my wife does the pickup in the evening so I'm less constrained in the evening"

He is not fazed by poor weather;

> "I did sometimes drive when I thought it was going to be too windy or too rainy but I realised too often, it's too windy or too rainy and actually if you just get on with it, its fine, so I just made the decision. I probably drive once or twice a year."

And he has attached even more positive meaning to his active commute as he notes:

> "I think the initial choice I made to start cycling places was for environmental reasons and then subsequently, notably saw the health benefits that I was getting from cycling so I don't think that was ever so obvious to me until I stopped cycling."

Frank's active commute is not only a way for him to play his part in reducing his carbon footprint but also, is now a way to foster good health.

8.9 Conclusion

This chapter used personas - characters representing each of the six identified collective trajectories - to present the commuting biographies of "typical" persons relating to that trajectory. Firstly, the persona narratives presented the situational factors that influenced the engagement of different travel scripts at different points along a life course for the majority of individuals in these groups. More importantly, the chapter highlighted the situational factors surrounding the commuting turning point for each persona. These factors, presented within the key events faced by each persona were seen to lead to the engagement of a different travel script, either through a commute by car or by bus, bike or other alternative modes.

After the turning point, this travel script is sustained hence forming a habit. Personas representing the 1970s, 1980s and 1990s car - default as well as the 1990s alt- default trajectories were identified as expressing a facet of their identity in line with economising mental effort. For these personas, the stability of the situational factors faced together with the social - psychological attributes underlying the goals to minimise commute time and commute in a comfortable external environment were seen to reinforce the habit. Any threats to the engagement of their travel scripts after the turning point, such as the negative environmental impact of regular car travel, were dealt with by making compromise changes such as buying cars with fewer emissions.

This still allowed for the shortest commute time and a comfortable external or personal environment during commuting.

Personas Emily and Frank, representing the 1970s and 980s alt - default trajectories respectively, were identified as motivating the engagement of their travel scripts after the turning point by “an extra little thing in the system”. Threats to the engagement of these travel scripts, such as a long commute or exposure to poor weather, were dealt with through fundamental changes and restructuring of the meaning of their commute time or mode. For example, they developed a change in mind set or attitude by viewing the time spent commuting not as wasted but as contributing to another aspect of life such as relaxation; they also had a strong resolve to do their part for the environment. These changes made were still in alignment with the social - psychological attributes underlying the commute goals of independence from the car and peace or comfort of mind. The travel scripts were engaged and sustained despite the situational constraints faced.

The above highlights of this chapter emphasise the different levels of interdependence between the situational factors and the social - psychological factors underlying the commute goals in the engagement of the travel scripts. This interdependence, at play at both the turning point and later, seems to be mediated by the facet of self - identity being expressed by the commuting behaviour.

This interdependence also demonstrates the duality of the travel script - that mental structure that is proposed to link the situational and social - psychological factors in guiding commuting decisions. The concept of the duality of structure proposes that structures are both the medium and outcome of social practices; that they shape people’s practices and in turn these practices constitute and reproduce these structures. In this case, the travel script is the medium through which commuting behaviour is performed; it shapes commuting behaviour. This is demonstrated by the situational factors such as: the financial factors at *Further Education*; the social factors at the *Start of a Family*; or the availability of direct public transport routes. All these are assimilated and accommodated as the knowledgeability in the mental structure. They shape commuting behaviour by constraining and enabling it.

But how are these mental structures the outcome of the commuting behaviour? It is noted in this chapter that after the turning point in the commuting trajectory, a travel script is sustained leading to the formation of a habit. This habit formation is due to the

recurrent performance of a particular commuting behaviour. Although the engagement of the same or similar travel script becomes habitual after the turning point, each time it is engaged, it satisfies certain commute goals in line with a perceived self identity, as Chapter Seven clearly demonstrated. In addition, when the satisfaction of these goals seems threatened, for example, if the long commute started to seem bothersome for Emily or Frank, they would cope with it by allocating a more positive meaning to the commuting time. This strategy supports their resolve to make an extra effort to overcome situational barrier without compromising their environmental beliefs. It is such practices, such exercise of agency, which enable the same or similar travel script or mental structure to be reproduced over time and hence sustain the commuting behaviour.

Chapter 9: Conclusions

9.1 Introduction

This thesis proposes the travel script as the link between situational and social - psychological factors in influencing travel decisions along individuals' life courses. This is done by looking at the construction and engagement of the travel script at key events along the life course of an individual most especially at their commuting turning point. The travel script is conceptualised as a mental structure or representation of the individual's knowledgeability of the structures within which they are situated; which when activated organises the comprehension of the travel decision and gives meaning to the action. Below is a re - cap of the two overarching objectives of the research and the research questions that underpinned them.

1. To explore how commuters above 30 years constructed travel scripts along their life courses.
    a. What combination of knowledgeability factors is available to the individuals in the development of a travel script?
    b. How are these factors assimilated and accommodated into the travel scripts at different key events along an individual's life course?
    c. How do these factors constrain or enable commuting behaviour?
    d. How do the travel scripts for those currently commuting by car differ from those currently commuting by alternative modes, along the life course?
    e. How do the travel scripts differ among different cohorts?
2. To explore the engagement of a travel script at turning points along individuals' mobility biographies.
    a. What are the possible turning points in the mobility biographies for different cohorts; and the different current default commute mode?
    b. How does the perception of the knowledgeability factors affect the evaluation of the mental effort applied to engage a travel script at the turning points?
    c. How does the evaluation of mental effort validate certain identities?
        i. How are commute goals related to the evaluation of mental effort to engage a travel script?

ii. What needs, interests or preferences are accentuated and downplayed to filter out meanings for the commute goals during the process of evaluation of the mental effort to engage a travel script?
iii. What coping strategies are used to evaluate the threat to the meaning attached to the engagement of a particular travel script which satisfies a desired state of identity?

It is by answering these questions, that the objectives were achieved. The following section summarises the findings from the literature reviewed and the data analysis, noting where and how these questions were answered in the thesis. The chapter then discusses the contribution to travel behaviour literature; the implications of the findings for policy; and the limitations of the research including areas of further research that were left unexplored.

9.2 Summary of Findings

9.2.1 Findings from the Literature Reviewed

This research proposed a mental structure as the link between the influences of the situational and social - psychological factors in commuting decisions throughout an individual's life course. This mental structure was conceptualised as a travel script. Chapter One noted the significance of such an exploration in supporting the current policy approach, that aims to develop frameworks that support behaviour change towards more sustainable modes. Concepts from Anthony Giddens' Structuration theory, such as: structure as a rules - resources set; knowledgeability; reflexivity of structure and agency; and the duality of structure were presented as a theoretical framework to guide the exploration of this mental structure. Concepts from Glynis Breakwell's Identity Process Theory - particularly: assimilation - accommodation; evaluation; coping strategies; and self - efficacy - were drawn upon to complement the concept of agency.

Chapter Two presents a background to transportation policy leading up to the current policy approach that aims to encourage and facilitate behaviour change out of an individual's personal choice. The discussion notes that the vision of the future a country had influenced the focus of transport policy. For example, the UK's vision of a future dominated by car travel led to a longer time span of the emphasis of the road building

program over infrastructure for alternative modes compared to the other European countries, such as the Netherlands, Denmark and Germany, which from the 1970s, tried to accommodate alternative modes as well. As the decades passed, there developed in policy the recognition that individual preferences differ and therefore, there could not be a vision aligned to one travel mode for the future. If individuals were to be supported to change travel behaviour, their immediate environment such as their work or family situation and the perception of this situation had to be considered as influencing travel decision making.

Chapter three elaborates on the factors that make up the individual's immediate environment. These were noted as situational factors individuals faced along their life courses such as transportation policy, location, infrastructure, household composition and income. They were shown to influence the decision making process by presenting various constraints and enablers to individuals. These factors were also noted to be bounded by key events such as changes in the family, employment and residence.

The other factors in the immediate environment of the individual were noted as the social - psychological factors such as certain beliefs and attitudes people hold about their social and physical environment and the travel modes available, habits and perceptions of self - identity. Attributes such as feelings and expectations of freedom, comfort, convenience and guilt or personal obligation were said to underlie the attitudinal, normative and control beliefs. Habits were proposed as patterns of behaviour that draw on these beliefs and attitudes, and were expressions of self - identity.

The literature reviewed helped to point out some of the issues that the researcher would need to look out for during the data collection and analysis. In Chapter Four, the research methodology used to collect and analyse the commuting history narratives of 82 respondents in Edinburgh was presented. It highlighted the positionality of the research as a qualitative study within a constructivist and interpretivist epistemology. The narrative approach was proposed as best suited for this research owing to its emphasis on eliciting responses with minimal cuing from the researcher in order to get at the respondents own mental structure; as well as its mindfulness of the temporal order of events which was well aligned to the life course approach of this study.

The narratives were collected using retrospective in-depth interviews and analysed using Schutze's narrative analysis approach which involve indexical data mining and non - indexical data mining or thematic analysis. The indexical analysis involved

mining discrete information from the data to enable the formation of groups. The data was categorised into: two groups representing the current default commuting mode, as either the car or alternative modes; along five key life cycle events - *Further Education, Start of the first job, Start of a family, Moving to the current home,* and *Moving to the current job* - ; and three cohorts based on when respondents were old enough to drive, that is, the 1970s, the 1980s, or the 1990s and onwards. In-depth thematic analysis was carried out on the narratives within these groups. The summary of the findings from this thematic analysis is presented in the following sections - 9.2.2 and 9.2.3 - that show how Chapters Five, Six, Seven and Eight answer the research objectives.

9.2.2 Objective One - Travel Script Construction

In response to research questions underlying the first objective, Chapter Five explored the knowledgeability factors that are assimilated and accommodated into the travel script at different points along individuals' life courses. Knowledgeability was said to encompass the knowledge and perception of the situational factors and personal experiences that influence travel behaviour.

The situational factors mentioned by respondents as influencing their commute were seen to both constrain and enable the commute. Chapter Five concluded that the continued assimilation and accommodation of the situational factors allowed the engagement of different travel scripts at different key events along the life courses. This was because travel scripts at each key event involved different combinations of constraints and enablers. This research focussed on the key events: *further education; first job; having children/ starting a family; moving to current home*; and *moving to current job*. Certain constraints and enablers were more salient influencers of the commuting decision at different key events along an individual's life course. At the earlier events of *further education* and *starting the first job,* for example, the financial and proximity constraints, as well as close proximity and available public transport were the salient influencers of the commuting decisions at this time; social constraints and enablers were made salient and accentuated in the travel script at the key event, *starting a family.*

Therefore, in answer to the first objective, a travel script is constructed by the continued assimilation and accommodation of knowledgeability factors into one's mental structure. This illustrated the concept of structure as a rules - resources set. The knowledgeability factors that make up any travel script along a life course comprise

both the key events and the situational factors that constrain and enable the engagement of the travel script. The reflexivity of structure and agency was demonstrated by the changing travel scripts at different key events along the life course. This suggested that individuals' travel scripts or mental structures evolve through reflexive monitoring and rationalisation of the changing knowledgeability factors; and it is these travel scripts that are drawn upon to guide commuting behaviour.

9.2.3 Objective Two - Travel Script Engagement

Chapters Six and Seven answered the research questions underlying the second objective. By situating life cycle events along mode related events, Chapter Six, in particular, considered the turning points for each collective trajectory, and the perception of the knowledgeability factors surrounding these turning points. It also considered the influence or relationship of this perception with how individuals in these trajectories judged the mental effort expended in engaging the travel script at the turning point. It was found that for the 1970s cohort, starting a family was a noteworthy turning point in the commuting trajectory. The start and progress of a career influenced the mode changes for the 1980s cohort who currently commute by car and the 1990s cohort.

The discussion on the perception of knowledgeability factors at the turning points distinguished two groups. For most people who currently commuted by car (car - default), the effort expended in engaging a travel script at the turning point and later tended towards economising the mental effort. On the other hand, respondents in the 1970s and 1980s alt - default trajectories tended to go beyond this by drawing on an "extra little thing in the system" to motivate the engagement of the travel script at their turning points and later. These different judgements of the mental effort manifested the underlying psychological process of evaluation in which individuals give meaning to their commuting behaviour, in line with perceived self - identity. They also suggested that individuals not only exercise their agency through reflexive monitoring of the knowledgeability factors, but also through motivation by latent factors such as self - identity.

Chapter Seven used the difference in the judgement of mental effort as an identity segmentation criterion to answer the third research question underlying Objective Two, that is, *how the evaluation of mental effort validates certain identities*. The chapter discussed: the commute goal related to each identity group; the needs, interests or preferences accentuated or downplayed for each identity segment to filter out different

meanings for these goals; and the coping strategies employed when a desired state of identity, satisfied by a particular travel script, is threatened. This chapter presented a clearer demonstration of motivation, through latent self - identity, as a significant aspect of exercising agency.

It is shown that in order to preserve a desired state of self - identity, in particular the self - efficacy expectations towards a particular travel mode, respondents ascribed different meanings to seemingly similar commute goals of cost, control and comfort. Those who exhibited a tendency towards economising effort accentuated the need for the shortest commute time possible, comfortable personal space and external environment and general reduced hassle in the commute. They downplayed the financial expense and congestion delays related to a car commute. Those who exhibited an "extra little thing in the system" accentuated the need for a relaxed commute time, peace of mind in knowing that they are not dependent on the car or are playing their part in reducing the carbon footprint, and increasing their physical activity. They downplayed the long commute time, physical effort and general hassle associated with public transport and cycling or walking.

Additionally, when the desired state of efficacy expectations seemed threatened either by an argument against the desired mode or in favour of the alternative mode, coping strategies were engaged to counter the cognitive dissonance. Those with a tendency to economise effort made compromises between the perceived threat and the desired expression of their identity, for example by buying low emission cars to reduce their environmental impact. Those who had an "extra little thing in the system" or resolutely exerted effort did so through fundamental changes in their lifestyle and mind-set, for example by allowing enough time for the commute and ascribing a different meaning to the commute time - as relaxing rather than wasted time.

Chapter Eight synthesises the findings from Chapters Five, Six and Seven and by presenting them as one character's or persona's experience, aims to present a holistic and deeper understanding of the travel script as the link between situational and social - psychological factors that influence travel decisions. It emphasises the interdependence between the situational factors and the social - psychological factors underlying the commute goals in the engagement of the travel scripts at both the turning point and later. This interdependence is proposed to be mediated by the facet of self - identity being expressed by the commuting behaviour, that is, either economising of effort or

"an extra little thing in the system". This interdependence of the situational and social - psychological factors demonstrates the duality of the travel script; as both the medium and outcome of commuting behaviour. The travel script shapes behaviour as illustrated by the situational factors that form the mental structure's knowledgeability, thus constraining and enabling commuting behaviour. The reproduction of the mental structure by the individual's behaviour over time is demonstrated by two facts: every time the travel script is engaged after the turning point, it is evaluated as satisfying certain commute goals; and every threat to its engagement is coped with in a fashion aligned with the perceived self - identity. This allows the commuting behaviour - supported by the reproduced travel script - to be sustained over time.

9.3 Contribution to Travel Behaviour Literature

This research contributes further information to a number of areas in travel behaviour literature. As far as the researcher can tell, this is the first piece of research in travel behaviours that draws on the concepts of Structuration theory as a framework for the research. The study also contributes to the literature on mobility biographies, travel habits and travel identity literature.

9.3.1 The Use of Structuration Theory Concepts

This study clearly shows the complementarity of structure and agency in determining behaviour. This was the initial stand of the study in proposing that there is a mental link between situational and social - psychological factors; and indeed why Giddens' Structuration theory appealed to the researcher. In particular the study draws on the following concepts: knowledgeability and the nature of structure; the nature of agency; the reflexivity of structure and agency; and the duality of structure.

The study presents the situational factors surrounding the commute at different key events, such as the financial, infrastructure, and social factors, as the knowledgeability factors that are assimilated and accommodated into the mental structure (travel script). These knowledgeability factors form a rules - resources set with a dynamic nature; changing with changing circumstances and both enabling and constraining behaviour. Therefore, the travel script or mental structure is shown to be made up of the knowledgeability of the individual; and to be a rules – resources set that is both enabling and constraining of agency.

The evolution of the travel script or mental structure along the life course suggests the exercise of agency through reflexive monitoring and rationalisation of the changing knowledgeability factors in order to construct or reinforce a travel script. That it is these changing travel scripts at different key events along the life course that are drawn upon to guide subsequent commuting behaviour, demonstrates the reflexivity of structure and agency. The difference in the judgement of effort discussed in Chapters Six and Seven suggest that individuals not only exercise their agency through reflexive monitoring of the knowledgeability factors, but also through motivation by latent factors such as self – identity.

The interdependence of the situational and social - psychological factors discussed in Chapter Eight demonstrates the duality of the travel script (mental structure). The travel script shapes commuting practices through the enabling and constraining knowledgeability factors; in turn the reflexive monitoring and rationalisation of the knowledgeability factors, the motivation of the commute behaviour through latent self - identity, and the recurrent performance of the commuting behaviour contribute to the reproduction of the travel script.

9.3.2 Contribution to Mobility Biography Literature

This study supports the notion that changes in travel demand may be triggered by key events in the life course; and that these changes are embedded in other biographies such as the residential, household and employment biographies, proposed by researchers like Van Acker (2010), Scheiner (2007), Lanzendorf (2003), and van de Waerden et al. (2003). From Chapter Six, it is clear that changes in the life course (which were changes in other life domains) prompted changes in the commuting biography for different collective trajectories.

The study further shows that change in the mobility biography may not immediately follow the change in other biographies. The continued experience of situations brought about or made salient by the key events in other biographies can also be the cause for change. For the 19980s car - default trajectory, for example, we see that people did not necessarily buy a car and start commuting as soon as they started their first job, but more likely, the progress of the career and a more stable income led to the start of a commute by car. In addition, certain events along the life course involve a series of other events over a period of time. Starting a family in particular brings about different

constraints - when the child is below five years, or between five years till secondary school- all of which could influence a change in the commuting biography.

From Chapters Six and Seven, it is proposed that the turning point in a commuting biography is mediated by the social - psychological factors such as feelings regarding time, control, physical or mental effort or comfort, which underlie the expression of a particular self- identity. Therefore, the extent to which situational factors, bounded by key events along a life course significantly influence a turning point in the commuting biography is proposed to be dependent on a facet of an individual's self - identity and how they express it.

9.3.3 Contribution to Literature on Travel Habits

This study leans towards commuting habits as a tendency that connects people's behaviours to their identities, as proposed by Schwanen et al. (2012); as opposed to simply a repetitive automatically triggered behaviour. This is illustrated in the discussion on the engagement of the travel scripts, that is, the continued evaluation of knowledgeability factors and the motivation of the travel script by the attributes underlying self - identity. However, the study also agrees with aspects of the research that views travel habits as automatically triggered behaviour (Orbell & Verplanken, 2010; Aarts & Dijkersterhuis, 2000; and Verplanken et al., 1997):

- That travel habits, in this case the continued engagement of the same travel script over a part of the life course, are goal directed. Chapter Seven discusses the different goals commuters aim to satisfy by the engagement of a script for a car or an alternative modes commute.
- That travel habits are enabled by the presence of particular cues. Chapter Five showed different situational factors that are presented by key events which enabled or constrained the engagement of different travel scripts.
- That habits help to alleviate the mental effort involved in decision making. Chapter Seven shows that while - even for respondents with "an extra little thing in the system"- initial performance of a commute by alternative modes might have been difficult, making a habit of it made engaging that travel script easier and they even started attaching positive meaning to what may be considered a more difficult situation. This particular aspect about habits complements Schwanen et al.'s (2012) view that habits develop through the continuity of change, that is, an individual's tendency to undergo change will decrease with

each repetition and at the same time, their ability to initiate change will increase with each repetition such that the change is initiated with increasing ease and effort.

9.3.4 Contribution to Literature on Travel Identities

The research agrees with studies such as Murtagh et al., (2012b) in noting that self - identities guide actions that are chosen or resisted. This is seen in the fact that different groups ascribed different meanings to seemingly similar commute goals such as control, timeliness and comfort. It is proposed that these meanings are different because they are aligned to different self - identities. This is illustrated by the two main self - identities that emerged: that expressed by a tendency to economise mental effort in commuting decisions; and the other expressed by resolutely exerting effort (the "extra little thing in the system").

Furthermore, the study shows that the strategies used to cope with threats to particular expressions of self - identities through commuting seem to be different depending on the identity group. The respondents who exhibited an extra little thing in the system undertook fundamental changes in their lifestyles and accepted the drawbacks associated with public transport or active travel. They ascribed the commute other meanings such as time well spent though exercise or "stolen time" to read or unplug at the end of the day. Effort economisers coped more by reaching a compromise, for example by taking alternative routes in case of congestion or buying more eco - friendly cars to ease the cognitive dissonance.

The study also contributes to the travel segmentation literature such as, Jensen (1999) and Anable (2005), by proposing two more identity groups that are expressed by travel, in particular commuting behaviour, that is, effort economisers and those exhibiting "an extra little thing in the system". As suggested by these researchers, these identity groups are not to be taken as a road map for creating transport systems. Rather, they help to emphasise the diversity and differences in the needs and perceptions of individuals when deciding how to commute to work. This alludes to the effectiveness of a coordinated effort between different agencies and people in implementing transportation strategies, rather than a single strategy, as will be discussed in the following section.

9.4 Implications for Policy

The approach of public policy, including transportation policy, shifted in the late 1980s to a greater reliance on individuals as vehicles for social and environmental change. This is evident in the voluntary behaviour change programs such as TravelWise which aimed at providing individuals with information in the hope that they would act according to increased knowledge. The findings of this research are useful to policy makers at the local authority or national level as they contribute to the knowledge surrounding how individuals draw on both situational and social - psychological factors in making decisions related to commuting.

Policy makers tend to focus on particular areas which are judged to be most cost effective and have the greatest impact socially and economically. This research presents a number of factors that could influence individuals to change their commuting behaviour, for example, situational factors, key events or changes along an individual's life course, beliefs, attitudes and other social - psychological attributes underlying habits and the perception of self - identity. Not only do these factors influence travel behaviour as numerous research has shown, but also, the reflexive interaction of these factors with each other in an individual's mental structure has been shown by this research to significantly influence change along commuting biographies. This suggests that implementing just one particular strategy is insufficient to bring about a shift towards more sustainable modes for commuting. There has to be a coordinated and concerted effort among individuals, organisations and government institutions. In particular, two issues emerge as being of interest to policy makers in trying to encourage a shift away from car dependency for the commute:

1. Firstly, the importance of more extensive infrastructure for public transport and active travel;
2. Secondly, the importance of the social environment in inculcating a culture where commuting by public transport or active travel is the norm.

9.4.1 Availability of Extensive Infrastructure

One of the key conclusions of Chapter Five was the fact that infrastructure constraints influence the travel script at every key event. This is because they are location related constraints that inevitably influence travel from one place to another. In the 1980s and 1990s, there was a missed opportunity for policy implementation to influence the commute mode especially for the car default respondents in the 1980s cohort. In the

1980s, transport policy withdrew its support for public transport, lacked consideration for active travel infrastructure and gave free reign to car use. In this time, what most people would have been exposed to personally or vicariously would have been the poor public transport and active travel infrastructure. The government in the 1990s was reluctant to be seen as anti - car, therefore, even though it supported the voluntary behaviour change programs such as Smarter Choices, funding for public transport and active travel infrastructure was not prioritised. It is possible that improved public transport and active travel infrastructure, together with a campaign to make people more aware of the possibility to travel with or without children on these public transport and active travel modes might have seen some of these respondents retain a commute by alternative modes. The lesson for the future here is that availability of infrastructure plays a big role in shaping culture. Infrastructure for cars at the moment has an advantage over that for public transport and active travel. If policy makers are serious about bringing about travel behaviour change, funding for public transport and active travel infrastructure needs to be prioritised.

The findings from this research also emphasise the need for improvements to the public transport and active travel infrastructure that connects housing and work places in a more direct way. The park and ride next to the Heriot-Watt University could, for example, be connected to the other park and rides just off the Edinburgh by-pass, allowing people to move from one location at the outskirts of the city to another location also at the outskirts without having to go into the city centre.

There is also a need for better active travel infrastructure, especially for those residences that are on the periphery but closer to the work places also at the periphery. Improvement in the active travel infrastructure might create more occasions for people to see other people, possibly their neighbours or work colleagues commuting by active modes. People are encouraged to behave a certain way when they see more people behaving the same way. With time, this behaviour of the increasing majority might become the culture or norm of the society.

9.4.2 Culture Change: A Change in Mind-set

While improvements in infrastructure play a big role in moving people to active travel, there is still need to consider the impact of social culture. In the development of guidelines for voluntary travel behaviour change initiatives, the feedback system of the initiatives which allows households to enter into dialogues about their travel behaviour

should be encouraged and well developed. This better promotes the processing of messages which could lead to longer lasting behaviour change. People are not oblivious to the negative impacts of daily car use, as illustrated in Chapter Seven by the coping mechanisms of car - default respondents. Nevertheless, they are unwilling to go through a drastic change in their lifestyles.

There needs to be a gradual change in culture to accept cycling, in particular, to a work place. Pooley et al. (2013) note the perception of cycling in the UK as more of a recreational activity than a commute mode, requiring a lot of effort. People in the UK feel the need to cycle quickly, be assertive with the traffic and wear special clothes whereas countries with higher rates of cycling such as the Netherlands and Denmark have a stronger culture of cycling slowly in everyday clothes and arriving at your destination in a state where it is easy to transfer straight into the work environment. This change in mind-set is not only required of the social culture but of individuals themselves.

A program such as the one to one approach of the personalised travel planning would be beneficial in helping individuals to make small commitments. Such a program allows an individual to constantly think about their behaviour. Bem's Self - perception theory - discussed in Chapter Three - noted this self - perception as instrumental in the "foot in the door" phenomenon whereby people may take on a large or demanding request if it is preceded by a less demanding act of compliance. The "extra little thing in the system" observed in this research has shown that many of those respondents who have never had a regular commute by car or who broke from a regular car commute made personal commitments that allowed them to value and enable their alternative modes commute. Many of them started with small commitments and built up the habit of commuting by alternative modes with time.

This shows the potential for building on to small commitments regarding the commute. This research and the mobility biographies literature propose key events in the life course as opportunities to consider change. In this regard, moving to a new work place presents a unique opportunity for encouraging change as these work places can be the public arenas for making and building on to small commute related commitments. Work place travel plans and policies can be used as a means of presenting to new employees the travel culture the organisation aspires to. Such plans can be implemented in such a way that people do not feel under pressure to completely change how they live but

could simply commit to a small change, every month or fortnight, gradually working their way to more frequent alternative modes commutes.

The change in mind-set and the provision of infrastructure have to go hand in hand. There needs to be a concerted effort on the side of policy implementation to provide these programs at the same time, without focussing on only one aspect, so that their impact can reinforce each other's influence.

9.5 Challenges and Limitations of the Research

Throughout the interviewing process, analysis and writing up process, the research followed a process of constant reflection. At first, this was simply to remind myself of and clarify the research objectives and the reasons behind them. With time, I found that going back to the literature influenced the analysis and in turn, the analysis pointed to other possible literature. This reflexivity was especially important in helping me understand the research objectives better, thus providing better answers to them through the analysis. The following is a discussion of the limitations and challenges faced and their mitigation. They include: methodological limitations; and challenges and limitations of the theoretical concepts used.

9.5.1 Methodological Limitations

As mentioned before, this study uses retrospective narratives of people's commuting histories. Retrospective interviews have a limitation of being reliant on the interviewee's memory and other strategic communication. Since the study was trying to tease out mental representations at particular points in the commuting past of respondents, it is possible that some responses were influenced by attitudinal dispositions salient at the time of the interview, rather than those salient at the period in the past under investigation. Never the less, these interviews proved a valuable tool for this particular study. It was important that the respondents' narratives reflected factors from their own mental structure rather than those prompted by the researcher. The largely unstructured nature of the interview allowed for this. However, the respondent was initially guided to narrate according to the progress of their life course, thus giving the interview a loose structural form.

Qualitative studies usually utilise a small sample and provide a very in-depth analysis of different aspects of the data. The 82 narratives used in this research may be considered as too many for a qualitative study but also too few for the generalisation that a

quantitative study may be aiming for. With regard to the depth and breadth of analysis that was achieved by the use of Schutze's approach is this research, in comparison with the depth of conventional qualitative research and the breadth of quantitative research, figure 9.1 below illustrates:

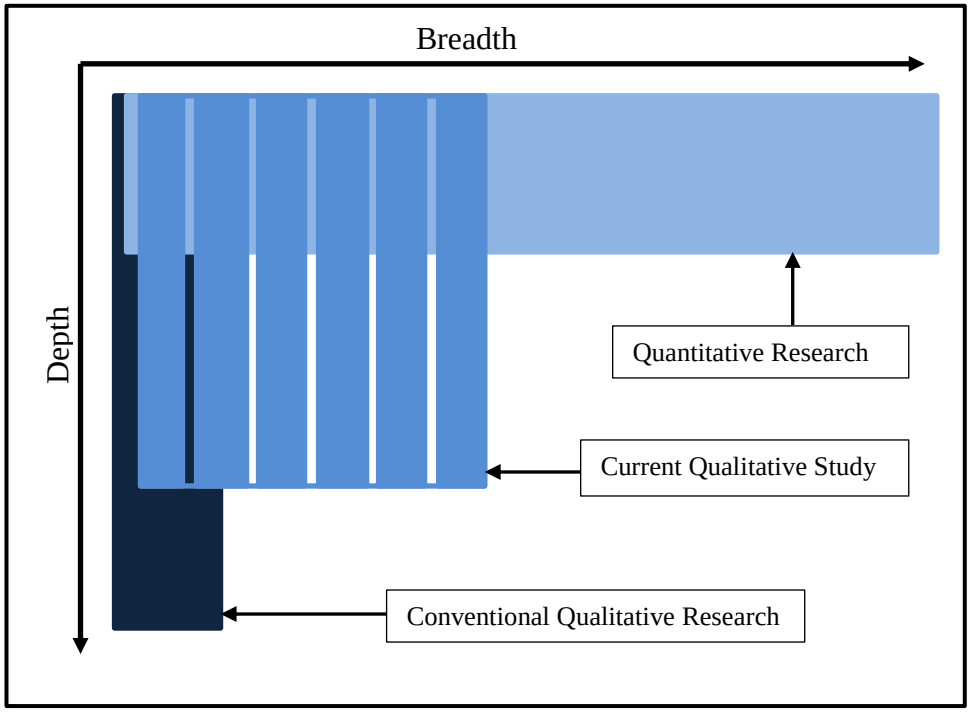

Figure 9.1: Comparative illustration of the depth and breadth of analysis achieved by this study

Chapter Four makes it clear that this study was qualitative, and the narrative approach used for data collection allowed for the collection of a very rich source of information which is important for any study that aims for a deeper understanding of behaviour change. While qualitative analysis cannot be completely free from the subjectivity of the researcher, in this study, I chose as much as possible to refrain from having my preconceived ideas influence the information solicited from the interviews, as well as the themes arising from the initial analysis. This meant that analysis of such a large amount of data would not be straight forward. The use of Schutze's narrative analysis approach, however, was invaluable in systematically sieving and analysing different layers of the data, and then sewing the layers together in a way that provided a seamless picture of a life course. This analysis approach is very much suited to analysing large amounts of qualitative data as it aims at creating a few groups, connected by a common trajectory from the vast information. The approach therefore was instrumental in the

formulation of and comparison of six commuting trajectories as the layers of age or cohorts and key events were sewn back together.

The reliance of the research on one data collection method has to be admitted as a weakness of the research. Given more time, the research would have benefited from focus groups, for example, of respondents aligned with the different personas in order to test out and provide a deeper understanding of the commute goals and coping strategies gleaned from the narratives, as well as the latent self - identities proposed.

9.5.2 Challenges and Limitations of the Theoretical Concepts

The analysis of data in this research was guided by the concepts drawn from Structuration theory. The theory is criticised as unclear as to what a structure really is. Coupled with the idea that structures are virtual systems and the concept of the reflexivity of structure and agency, this created a potential methodological problem for this research that was investigating a mental structure. Initially, the line between which factors or themes that would be analysed as making up either the structure or agency was blurred. This challenge was mitigated by the elaboration of the concept of structures as a set of rules and resources enabling and constraining agency; as well as the conceptualisation of agency as encompassing reflexive monitoring, rationalisation and latent motivational factors.

Due to time constraints and the fact that the life course in this research is observed retrospectively, concepts such as the assimilation - accommodation of situational factors or reflexive monitoring of situations could not be closely tracked to show the different elements as they are incorporated into the travel script or mental structure. Following the commuters on their journeys for a period of six months or more might have achieved a better result. This limitation was mitigated by considering the content of the travel script at different points along the individual's life course. The assimilation - accommodation process and the reflexive monitoring of the situational factors were presumed to have taken place because of that the changing content of the travel script at the different points along an individual's life course.

9.6 Proposed Areas for Future Research

This study has ably demonstrated the travel script as the mental link between situational and social - psychological factors in influencing commuting decisions along a life course. However, due to the richness of the data collected; and the time and financial constraints to the research, some information was left unexplored and therefore the scope for further research is considerable.

Some of the unexplored parts of the data include:

- The parts of the narratives related to the period before the start of *further education*, which could be used to investigate childhood influences on the commuting trajectories and aspects of travel socialisation.
- Exploration of wider historical changes that might account for the differences observed between the cohorts. This could be done using secondary data for the historical changes together with the time lines for the occurrence of different key events for the different cohorts.
- Exploration of social identities such as being a parent, university student, or professional and how their motivation of the engagement of a travel script compares with the travel identities proposed by the research.

Other suggestions of areas for future research arose out of the reflection during the analysis of the data. They include:

- How is the "extra little thing in the system" that enables a high-cost environmental behaviour like travel behaviour developed by some individuals but not others, and therefore how could it be fostered? This could be investigated using a comparative study between with people who self - report possessing this "extra little thing in the system" and those who did not report possessing it but in this study fell within that category. The comparison could focus on what they consider to be turning points in their commute, the goals for their commute and the coping mechanisms they would employ.
- Are men and women affected differently by different key events and if so, does the difference influence the turning point in the collective trajectory? Investigation of the key event - *starting a family* - would be an interesting starting point since biologically, men and women have fundamentally different experiences of the introduction of children into a family. It would also be worth

finding out if respondents in the different cohorts differ in their experiences of the commute for the same key event such as *starting a family*.

- What other goals related to self - identity principles such as continuity and distinctiveness can be gleaned from the narratives and what coping mechanisms relate to them? This could be assessed by focus group discussions with respondents who fall within the identified collective trajectories or personas.
- To what extent might changes in the life course be considered biographical related or related to other macro factors such as technological or political considerations? This question relates to the exploration of wider historical changes in relation to the differences in the cohorts.

These areas for further research would deepen the understanding of the travel script as the bridge between situational factors and social - psychological factors in travel behaviour decisions; and in general would contribute to the knowledge of the factors that influence individuals' commuting decisions.

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